Rodent Control in Food Establishments*

ROY MOORE

Regional Director, Division of Game Management, U. S. Bureau of Biological Survey, State College, Miss.

IT is a pleasure and an honor for me to be here to participate in the discussion of a problem of major importance to both the American Public Health Association and the Biological Survey, the health workers being interested in safeguarding the health of this nation, and of the world, from rat-borne diseases, and the survey in controlling an animal that is a greater menace to the health of mankind and a greater destroyer of property than any other in the world.

My subject, "Rodent Control in Food Establishments," means rat control in food establishments, because the rat constitutes the major rodent problem in such places and, with the exception of the house mouse, is the only one with which we need be concerned. The brown rat (*Rattus norvegicus*) is the common rat known throughout this country. Another species of the same genus, the black rat (*Rattus rattus*), is present in parts of the southern and southeastern states.

I am well aware that members of the American Public Health Association are much more familiar than I am with the diseases of human beings that rats transmit and the manner in which each of those diseases is harbored or incubated; therefore I shall make only passing reference to some of the more important of the rat-borne diseases.

Bubonic plague, after its first occurrence in San Francisco in 1900, was contracted by ground squirrels of adjacent areas and has become endemic in our native fauna to such an extent that it has not been possible to eradicate it. This form in the wild rodents is known as sylvatic plague and has been identified in several thousand rodents, including ground squirrels, mountain rats, deer mice, and woodchucks, in California, Oregon, Utah, Idaho, and Montana. The sylvatic form of plague is apparently not highly contagious to man, but there is the disturbing possibility that common rats may become reinfected in the population centers and the plague may then return to the more serious form.

Endemic typhus, or Brill's disease, is assuming serious proportions in the United States. There was a rapid increase from 1931 through 1933, at which time it was approaching epidemic proportions. Early in 1934 anti-rat campaigns to control typhus fever were undertaken by the Biological Survey as a Civil Works Administration project in coöperation with the U. S. Public Health Service and state health departments. Poisoned baits were exposed and trapping operations conducted on more

* Read before the Food and Nutrition Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 20, 1936.

American Journal of

Public Health

And The Nation's Health

Volume 27 January, 1937 Number 1

Serodiagnostic Tests for Syphilis
PARRAN *et al.*

Epidemiology of Yellow Fever
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Venereal Disease Program
BAKER

Maternal Mortality
TUCKER and BENARON

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PUBLIC HEALTH EDUCATION*

To Librarians, Research Workers, Students, and Health Education Workers:
In earlier years the annual index to the *American Journal of Public Health* carried no references to "Education and Publicity" or "Public Health Education" department in the *Journal.*

This paragraph then supplements the index: starting with July, 1923, the department will be found in all issues, except in two of 1924, and one each in 1929 and 1935.

Shall We Have a Clinic on These Pages?—Some years ago we conducted a clinic on printed matter in a welfare magazine. Many agencies in different cities sent specimens to be criticised or commended in detail. It has been suggested that the time is ripe for a similar experiment in this department of the *Journal.* Only in this case we favor not limiting the effort to printed matter. Let the examples come from various technics, including news story, radio talk, etc. Probably we would call upon leading technicians as consultants, thus broadening the base of the comments.

If you favor the idea please prove it by submitting something for comment, taking your chances on what may come out in the wash.

Give Them Air!—Health workers *are* human beings. They need air and a reasonable temperature in meeting places as much as that mysterious entity, "the man on the street."

And health workers, as do other human beings, are likely to accept unwholesome meeting conditions rather than to take the initiative in opening windows and shutting off heat.

The hottest and closest meeting place we have ever endured as a guest speaker was when attending a state health meeting in one of our most health progressive states.

Thirty Is the Limit—Training volunteers for social work was presented by Mrs. D. K. Rose at the National Conference of Social Work. When speaking of various courses conducted in St. Louis, it was said that

> Thirty to 50 is a possible group for lecture courses, whereas a limit of 30 must be maintained in a discussion group of any kind.

This is in line with common practice in state conferences of social work which conduct institutes, in several states, each course being limited to 25 or at the most to 30 students. Where the demands run high a second course may be organized.

Humanizing the Clients—A problem in translation of welfare and health work into the thought and language of laymen is considered in "Interpreters," by M. S. Routzahn. *Better Times,* 122 E. 22d St., New York, N. Y. Dec. 7, 1936. *35 cents.*

The closing paragraph says:

> Publicity workers are called upon to help persuade the public to make contributions or

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economic advantage of public health work which can be made obvious to the most penny-pinching taxpayer (page 1074). to prepare the public mind for acceptance of new health activities, to inform the public of the values and results of public health programs, is the continuing opportunity and obligation of the voluntary and philanthropic health agency (page 1075). . .

"Tribute to Dr. Park" (page 1082) is an editorial from *New York Times*.

In "Importance of the Supervisor in the Industrial Health Program," by Bristol, is a statement of how industrial supervisors may be (page 1085)

: . . taught the principles of mental hygiene in order that they may form wise mental habits of their own, and that they in turn may be proper guides to their working forces.

"Industrial Hygiene Activities in the United States," by Sayers & Bloomfield, includes:

Administration: . . . Educational program to acquaint industry and various groups interested as to importance of the problem (page 1091). . . .

"The Rural Health Conservation Contest as a Factor in Rural Health Development," by Buck (pages 1125–1127), describing this educational project, says (page 1126):

While participation in the Rural Contest is of assistance to all rural health units, it is particularly beneficial to those units in which public opinion has not as yet been sufficiently aroused to make the most effective use of its present health facilities or to seek more adequate services.

The new officers of A.P.H.A. on page 1146.

New members of Public Health Education Section, page 1147.

"Sedgwick Memorial Medal" (page 1148) is a reminder that medals and other awards are news, and that they offer opportunities for us to make the people in our states and cities more conscious of leaders in public health, and the health ideas for which they stand. We are not likely to overdo the use of personalities and awards in news releases and in our own organs.

The page about Dr. Frankwood E. Williams (page 1149) and the attention given publicly to his death emphasizes the news values of personalities.

10 Principles in Health Teaching —Under "What Shall We Teach in Hygiene?" Dr. T. B. Rice gives 10 principles in *Monthly Bulletin*, Indiana Division of Public Health, Indianapolis. Oct., 1936.

1. We must teach the body as a whole rather than as a collection of anatomical and physiological systems.
2. We must attempt to create in the mind of the child a vast admiration for the body and its various processes.
3. We must bring out the point in every possible instance that health and disease are the results of adequate cause, and that there is nothing of the supernatural or adventitious in the various processes involved.
4. We must make the health program a happy one. Beauty, grace, strength, endurance, and efficiency must take the place of the opposite qualities as motivating agents.
5. We must make the subject interesting, else it will be boresome and soon forgotten.
6. We must teach living rather than the technic of living. Hygiene must throb with life; it must be vital and to the point so that it will meet the problems of life.
7. We must teach hygiene in relation to the procession of life that reaches back to the day of creation. The human species bears certain relations to heredity and environment which are essentially the same as those of other living things and are best understood by a study of lower forms.
8. We must teach, on the other hand, that the human species has also a higher destiny and that there are considerations of morals, esthetics, ethics, social relations, and responsibilities, culture and civilization which have no counterpart in the lives of lower forms.
9. We must teach health as a means to a higher end and not as an end in itself.
10. We must somehow make the child understand that life is adaptable—that life finds a way—that life grows and develops.

Do we agree, or disagree? Would we add to, or would we subtract?

Hospital Clean

1937

BY BETTY LOU WILLIAMSON, R.N.

(It's worth two minutes to read it.)



A few days ago, I had the pleasure, and I may say honor, of demonstrating the Nu-Bidet to one of America's most outstanding urologists and gynecologists.

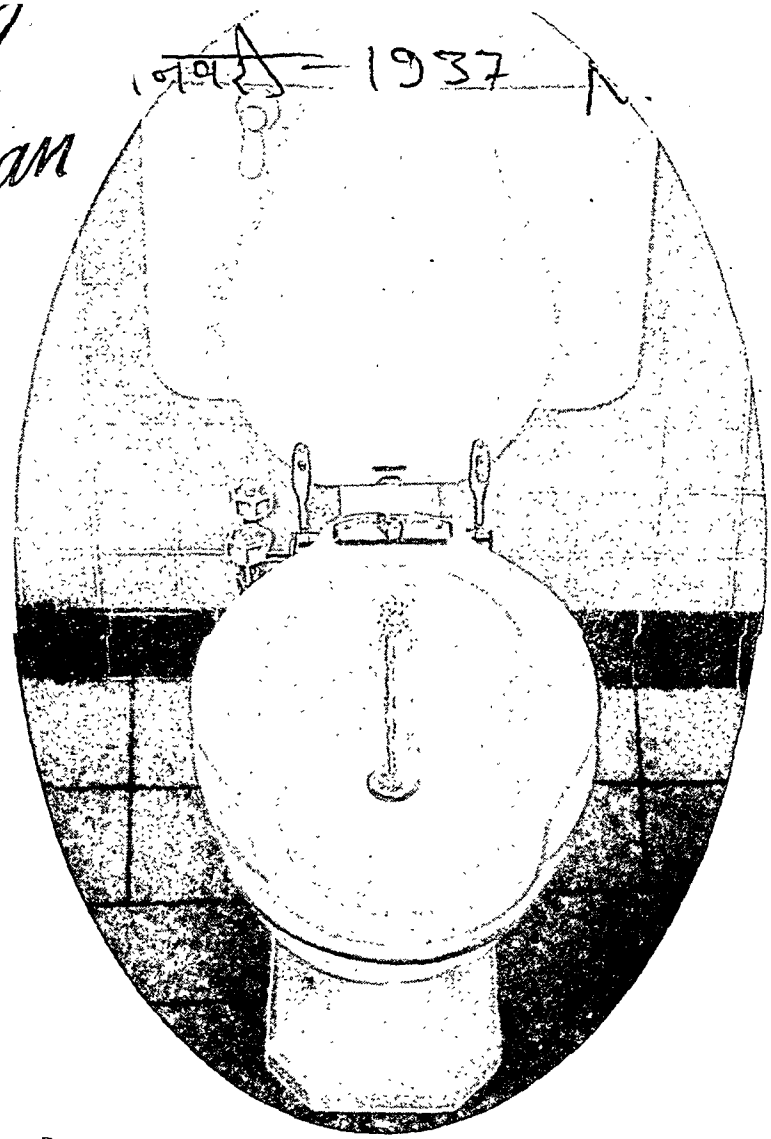
The odd thing that impressed me was that he said more in praise of the Nu-Bidet than I had the opportunity of saying, and he told me, before I could tell him, that it should be in every American home and hospital. So that made it unanimous.

He agreed with me that far too few people are completely clean — clean as I have been taught cleanliness—*hospital clean.*

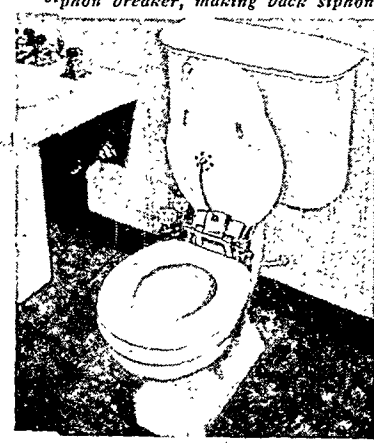
True enough, they take an external bath, never considering that an internal bath is equally, if not more, important to insure complete cleanliness and as a safeguard to health.

Apart from personal hygiene, he saw at once the great advantages of the Nu-Bidet in the treatment of urological, gynecological and proctological cases.

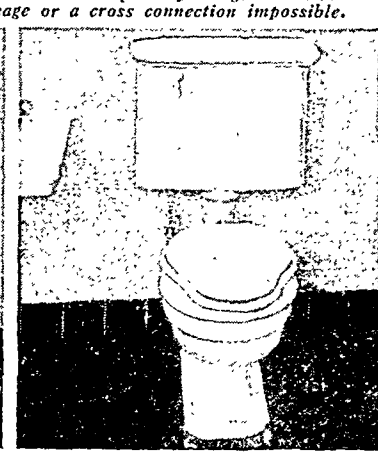
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Miss., has resigned as Health Officer of Holmes County, to engage in private practice in Fort Payne, Ala. He has been succeeded by George W. Mast, M.D.† of Memphis, Tenn.

WILLIS C. TEMPLER, M.D.† of Corning, N. Y., was elected President of the New York State Society of Industrial Medicine, at the 16th annual meeting held in Schenectady November 5.

AUSTIN E. HILL, M.D.† of Dallas, Tex., has been appointed Health Officer of Smith County.

DR. RICHARD S. AUSTIN has been appointed to the Cincinnati Board of Health, to succeed the late William Buchanan Wherry, M.D.,† of Cincinnati, Ohio.

CONFERENCES AND DATES

American Chemical Society. Chapel Hill, N. C. April 12–15.

American Physical Education Association. New York, N. Y. April 21–24.

American Society of Heating and Ventilating Engineers, 43rd Annual Meeting. Hotel Statler, St. Louis, Mo. January 25–27.

American Water Works Association—Four States Section. Philadelphia, Pa. April, 1937.

Arizona State Public Health Association. Phoenix, Ariz. April, 1937.

California Society for Crippled Children. San Francisco, Calif. January, 1937.

Child Labor Day. National Child Labor Committee. January 23–25.

County Engineers of California. Sacramento, Calif. February, 1937.

First International Conference on Fever Therapy. Columbia University, New York, N. Y. March 29–31.

First National Social Hygiene Day. February 3.

† Member A.P.H.A.

International Hospital Congress. Paris. July 6–11, 1937.

Massachusetts Public Health Association. Boston, Mass. January 28.

National Association of State Directors of Educational Research. New Orleans, La. February 20–25.

National Congress of Parents and Teachers. 40th Anniversary Celebration. February 17.

National Tuberculosis Association—New York Institute for the Training of Tuberculosis Workers. New York University (Washington Square), New York, N. Y. February 8.

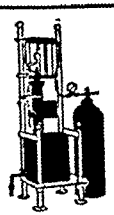
New York Heart Association—Committee on Cardiac Clinics, New York Academy of Medicine. New York, N. Y. January 12.

Society of State Directors of Physical and Health Education. New York, N. Y. April 21–24.

Tri-State Medical Association of the Carolinas and Virginia. Norfolk, Va. February, 1937.

Western Branch, American Public Health Association—Eighth Annual Meeting. Phoenix, Ariz. April, 1937.

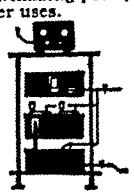
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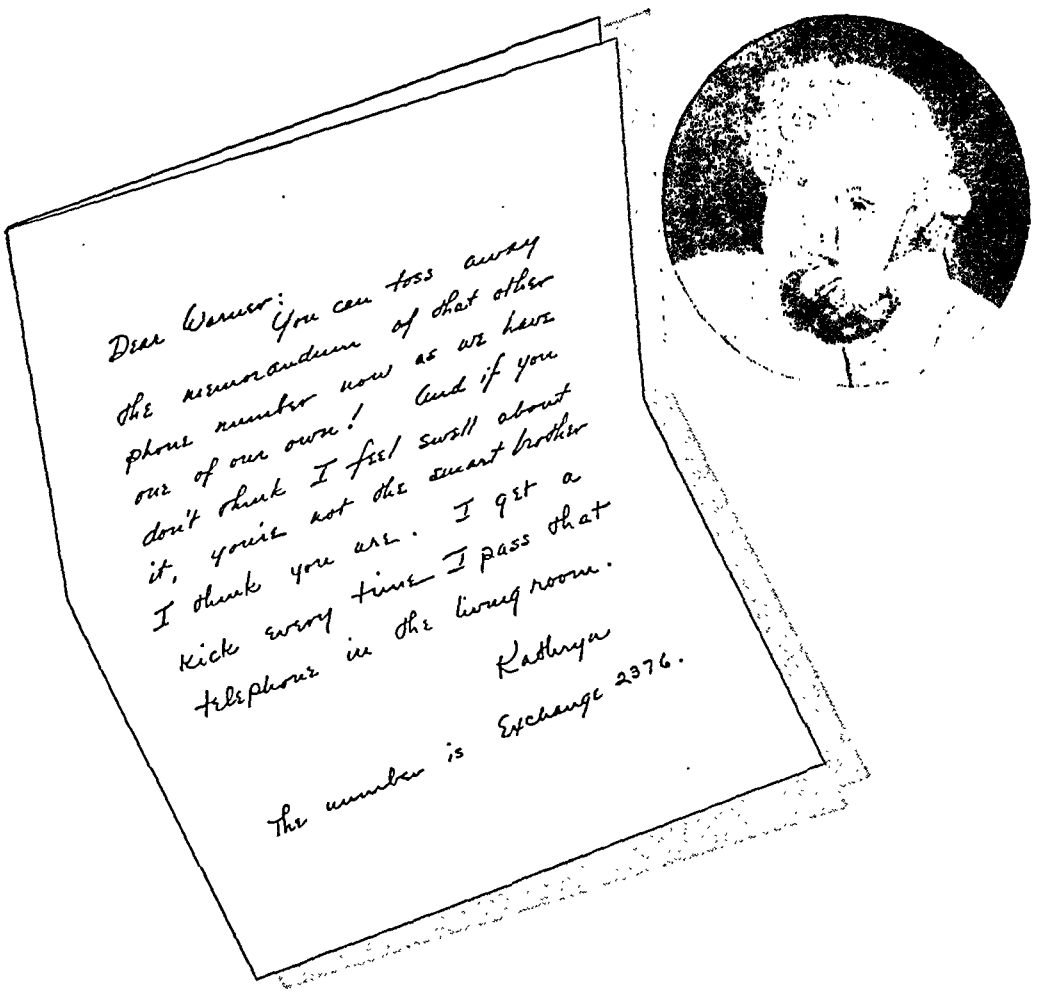
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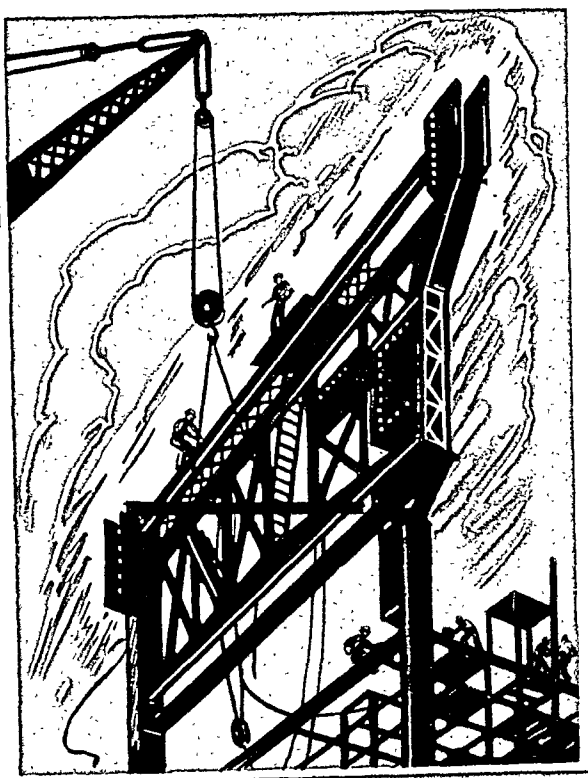
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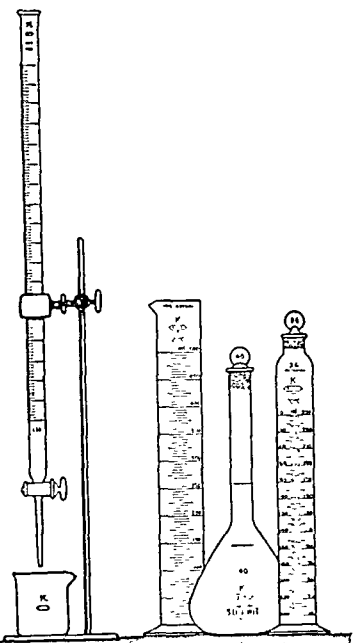
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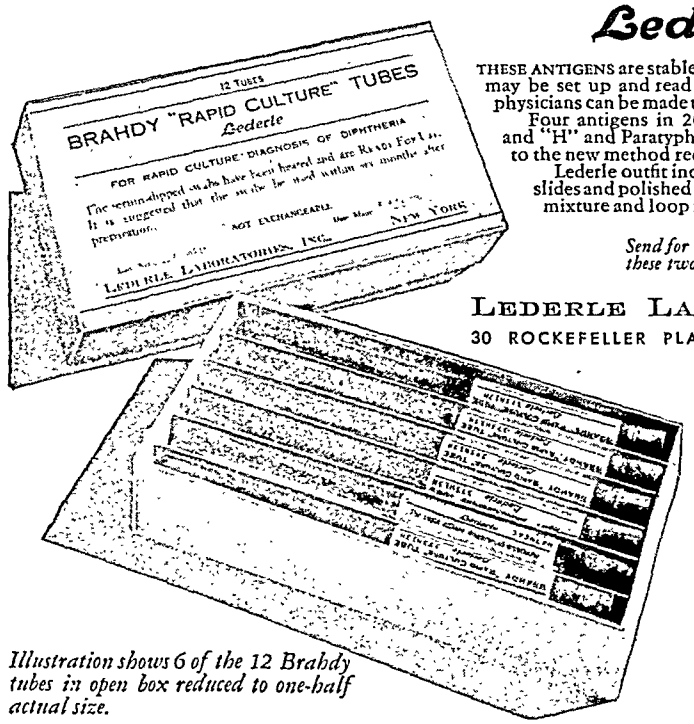


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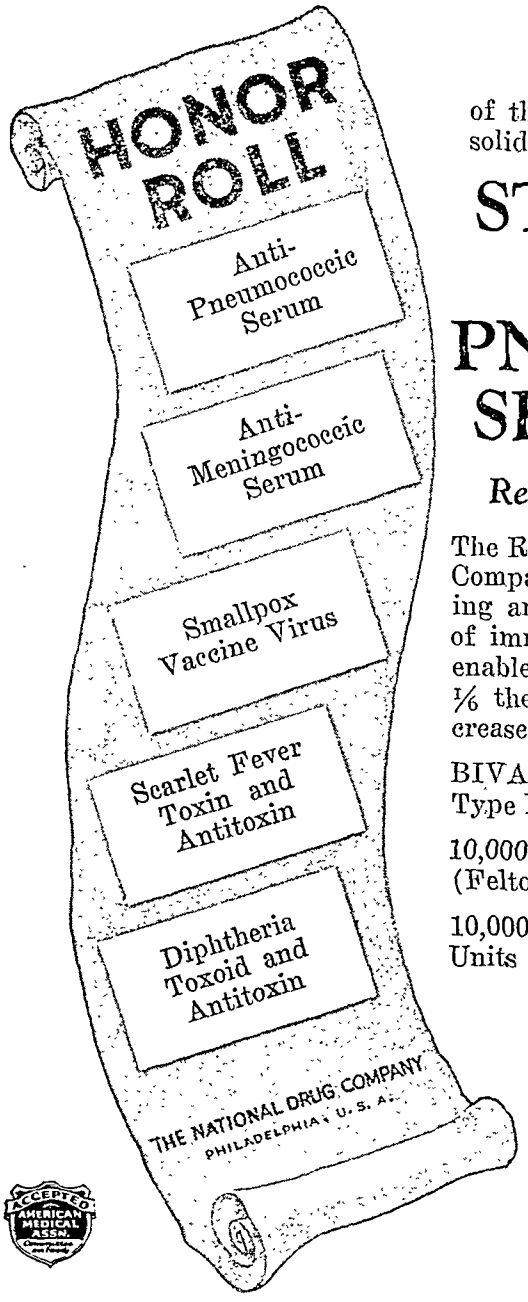
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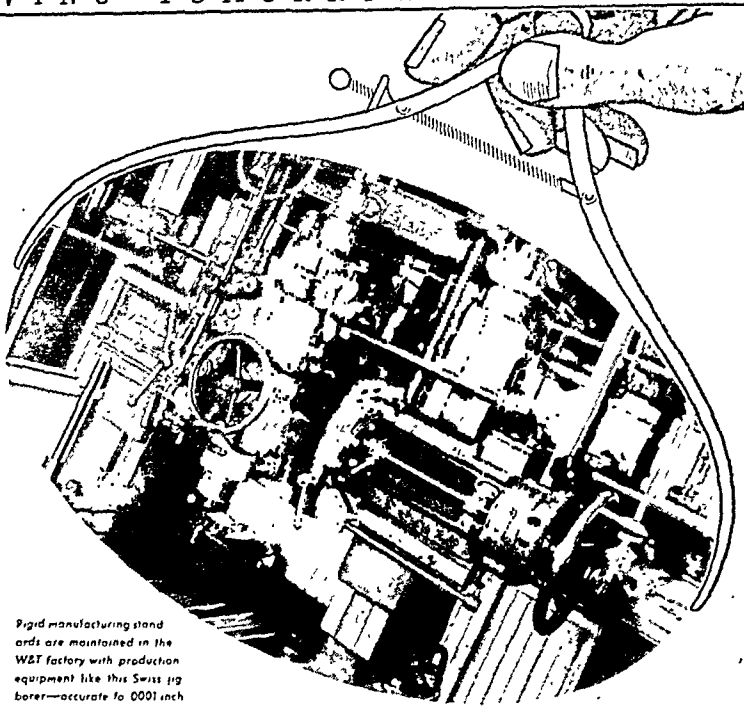
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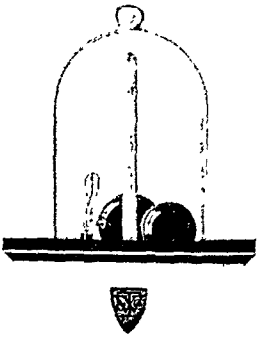
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American Journal of Public Health
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Volume 27 January, 1937 Number 1

The Newer Epidemiology of Yellow Fever*

FRED L. SOPER, M.D., DR.P.H.

International Health Division, The Rockefeller Founaation, New York, N. Y.

THE extent to which present beliefs regarding the epidemiology of yellow fever differ from those of just a few years ago is not generally known outside of the small group of workers actively engaged in the study and control of this disease. It must come as a great surprise to the majority of the members of the American Public Health Association, meeting here in New Orleans, one of the cities of the United States previously most exposed to the ravages of yellow fever, but since 1905 free of this scourge of the American tropics, to learn that the epidemiology of yellow fever is still a sufficiently important problem to merit a place on a program devoted to public health problems of immediate interest to health workers in the United States. Your surprise, however great, cannot equal the reluctance with which those engaged in the study and control of yellow fever in South America have relinquished their faith in the simple man-*Aëdes aegypti*-man epidemiology, consecrated by the almost miraculous results obtained in the West Indies and in North, Central, and South America during a full quarter of a century by a brilliant coterie of workers drawing their inspiration from the early work of Gorgas in Havana and of Oswaldo Cruz in Rio de Janeiro.

The period from the first observation of yellow fever to the demonstration in 1900[1] that its virus could be transmitted from man to man by the mosquito, *Aëdes (Stegomyia) aegypti,* may well be called the Dark Age in the history of the disease. More or less constant endemicity existed in many of the ports of tropical America, and the disease made not infrequent summer excursions into both the North and South Temperate Zones. Quarantine and other restrictive measures were common, and trade with the American tropics was difficult and costly.

* Read at a Special Session on Mosquito-Borne Diseases of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

† The studies and observations on which this report is based were made under the auspices of the International Health Division of The Rockefeller Foundation in coöperation with the Governments of Brazil, Bolivia, Paraguay, Peru, Ecuador, Colombia, and Venezuela. The report covers the work of numerous colleagues of the staff of the International Health Division and of the staffs of the Coöperative Yellow Fever Services in the respective countries.

the epidemiological rules which belong to yellow fever, to the point of suggesting a morbid entity not yet catalogued, were it not for the unusual dissemination of *Stegomyia calopus (Aëdes (Stegomyia) aegypti)* in those regions together with the clinical observations and autopsies made by persons well trained in the subject of yellow fever.

During 1922 it became very apparent that this federal campaign, which had been largely if not totally discontinued at the end of 1920, had failed of its objective and that yellow fever was still an important problem in Northeast Brazil. In 1923 The Rockefeller Foundation accepted an invitation to undertake the solution of the yellow fever problem in Brazil, and before the end of the same year Dr. Joseph White, veteran of many battles with yellow fever including and following the New Orleans campaign of 1905, had begun operations. Investigations were made and antimosquito measures were undertaken at all the principal coastal cities between Rio de Janeiro on the south and Manãos, the chief inland port of the Amazon Valley. No evidence was found of recent yellow fever south of Bahia or north of Ceará, and undivided attention was finally given to the region between these points.

Yellow fever dwindled on all sides, and by 1925 it was believed that the end of yellow fever on the American continent was in sight. It is true that an unexpected outbreak of the disease had been observed in Bucaramanga, Colombia, in 1923,[6] with no satisfactory answer to the question of the origin of the virus; but in the face of absolute quiet elsewhere on the continent during a period of 2 years, and the increasingly favorable picture encountered in North Brazil, the final solution of the yellow fever problem on the continent was anticipated in the immediate future.

The year 1925 has been mentioned as the end of the Golden Age of yellow fever epidemiology. That such was the case was not, however, fully apparent until some years later. The 1926 outbreak of yellow fever, which embraced the interior of several states of Northeast Brazil was attributed to the movement of non-immune troops through the region, lighting up and fanning to a visible flame the dying embers of infection which otherwise would have spontaneously disappeared. The intensification of antimosquito measures was followed by a rapid decline in the number of reported cases, and in 1927 Dr. M. E. Connor, who had taken over the technical direction of the service late in 1926, was able to report, after a survey trip covering the entire coast from Bahia to Pará, the Amazon Valley from the mouth of the river to Manãos, and the São Francisco Valley to Pirapora, that he could find no evidence of yellow fever activity. The renewed optimism, born of the failure to recognize cases of yellow fever anywhere on the continent during 11 months, was rudely shattered by single yellow fever positive autopsies in the States of Sergipe and Pernambuco in March and April, 1928, and by the discovery in May of the same year that the virus of yellow fever had again found its way into Rio de Janeiro, the federal capital, after an absence of 20 years.

The events of the months immediately following the discovery of yellow fever in Rio de Janeiro, one of the principal ports of South America, fully confirmed the great importance attributed to large centers of population, especially seaports, in the epidemiology of aegypti-transmitted yellow fever. Before the Rio de Janeiro outbreak terminated in July, 1929, locally infected cases had been recorded in the states of São Paulo, Minas Geraes, Rio de Janeiro, Bahia, Sergipe, Pernambuco, and Pará, and cases infected elsewhere had been seen at various ports between

Buenos Aires on the south and the inland port of Manãos, a thousand miles up the Amazon.

The rapidity of the decline of visible yellow fever following the suppression of the Rio de Janeiro outbreak was noteworthy, and between July, 1929, and March, 1930, less than a dozen cases were recorded for all Brazil. How optimistic was the reaction to this striking recession of yellow fever late in 1929 may be ascertained from the following paragraphs of the Annual Report of the Yellow Fever Service (unpublished) for the year 1929:

(page 3) (b) The history of the march of yellow fever gathered from available data indicates the centers where the infection might be expected to remain for an indefinite period in the absence of sanitary intervention. Such centers proved to be the capitals and here intensive efforts are practised. Additional services are started for interior areas whenever there is need for same and continued until the situation is again normal or local officials take up the work.

(page 9) . . . For the first time in the history of yellow fever prophylaxis, control measures are being applied in all centers where this disease was present or was menacing.

UNEXPECTED OUTBREAKS IN COLOMBIA AND VENEZUELA, 1929

While the situation in Brazil was occupying the attention of those responsible for its study and control, two totally unexpected and, at that time, unexplained outbreaks of aegypti-transmitted yellow fever were registered in Colombia and Venezuela, both in 1929. These outbreaks came at isolated points in the interior, completely out of contact with each other and with other known foci of infection. The place of one of these epidemics, Socorro, Colombia,[6] is a small town in the mountains east of the Magdalena River in the same general region as Bucaramanga, where the last previously recorded outbreak in Colombia had occurred 6 years before. The Venezuelan outbreak occurred in a series of small towns in the Cuyuni Valley, close to the towns of Guasapati and Tumeremo. This outbreak, like that at Socorro, cannot be linked in any way with the 1929 dissemination of virus from Rio de Janeiro.

DEVELOPMENT OF NEW EPIDEMIOLOGICAL TOOLS

For a proper understanding of developments since 1929, it is necessary to digress long enough to compare the tools with which epidemiologists worked before 1930 with those available today. Previous to 1930, knowledge of the distribution of yellow fever depended upon the occurrence of outbreaks of sufficient severity to be declared by local authorities. Acceptable diagnosis depended upon the demonstration of a series of cases with the classical symptoms of yellow fever occurring under those conditions considered necessary for its existence. Final judgment was suspended on isolated suspect cases awaiting the occurrence of other cases in the neighborhood, and such was the faith in the epidemiological picture of the disease that the failure to find other cases or the failure to find aegypti were at times the basis for deciding against a diagnosis of yellow fever. Knowledge of the disease was largely based on observation of its manifestations among immigrants in endemic areas and among non-immune populations during its occasional excursions outside of endemic zones. Epidemiological surveys were limited to a study of mortality statistics and conversations with the medical profession and with local authorities, and such surveys were thought sufficient to indicate the presence or absence of the infection in an area. Even as late as 1928, the epidemiological picture of yellow fever

was held to be more concrete and definite than the pathology of the liver of the yellow fever patient.

The events of 1928 and 1929, however, had shown that the pathological diagnosis based on the microscopical examination of liver tissue merits great respect, and the wealth of material obtained during the Rio de Janeiro outbreak established on a firmer basis among epidemiologists the belief that the pathological picture in the yellow fever liver is not duplicated by that of any other acute infectious disease. In 1930 [7] the examination of liver tissue, which had previously been used in suspect cases, was introduced as a routine measure for discovering unsuspected fatal cases of yellow fever in otherwise silent endemic areas.

Although the virus of yellow fever had been successfully established in laboratory animals in 1927 [8] it was not until 1931 that the perfection of the mouse protection test [9] enabled the epidemiologist to study the distribution of immunity to yellow fever on a large scale to delimit existing endemic areas, and not until 1935 was the easily transported mouse shown to be readily infectible with the virus of yellow fever from human cases in the field.

YELLOW FEVER CONTROL IN NORTHEAST BRAZIL, 1930–1936

When the speaker became responsible in June, 1930, for the technical administration of the Coöperative Yellow Fever Service jointly maintained by the Brazilian Government and The Rockefeller Foundation, it was already apparent that the brief optimism of a few months before was not justified. Yellow fever had just been shown to be present in the State of Rio de Janeiro in the south, in the State of Pernambuco in the northeast, and in the State of Pará at the mouth of the Amazon River. The most important control problem to be attacked was whether further extension of antimosquito measures to smaller towns would result in the elimination of yellow fever, which "key-center" control had failed to accomplish, and the most important epidemiological problem seemed to be to discover how the virus of yellow fever is maintained during periods of "invisibility."

The State of Pernambuco, a long, narrow area extending directly westward from the Atlantic Ocean, possesses in more or less well defined belts the various climatic conditions characteristic of Northeast Brazil, and was chosen for the initiation of intensified control measures and for special studies. An analysis of the available information regarding the distribution of yellow fever in Pernambuco previous to 1930 seemed to justify the division of the state into 4 rough epidemiological zones:

1. *Key-center Endemic*—Recife, the capital city and principal port, with a population of more than 250,000, a typical key-center of yellow fever infection which might be expected in the absence of antimosquito measures to maintain endemicity in and of itself, with the more or less constant occurrence of "visible" yellow fever in immigrants from non-endemic areas.

2. *Regional Endemic*—The heavily populated coastal plain, where important outbreaks of yellow fever were rarely reported but where the presence of the virus was from time to time made manifest through the infection of occasional foreigners.

3. *Endemo-epidemic* — A relatively heavily populated zone just back of the coastal plain, where yellow fever was frequently reported as sharp epidemics in the native population.

4. *Non-infectible*—The sparsely populated Sertão or hinterland comprising roughly the western half of the state, subject to occasional droughts of great

severity, with no history of yellow fever in the past.

The plan of campaign drawn up in June, 1930, called for the routine organization of anti-aegypti measures in all cities and towns of 2,000 population and over throughout the key-center endemic, the regional endemic, and the endemo-epidemic zones, leaving only the "non-infectible" zone without control. The extent to which this program differed from the original key-center theory of control can be appreciated when it is remembered that Carter [2, p. 20] states in discussing the spontaneous disappearance of yellow fever:

> It has disappeared from Cartagena, Barranquilla, Maracaibo, Cucuta (towns of from 20,000 to 75,000 people); from all of Hayti and Santo Domingo; from Porto Rico, St. Thomas and a host of smaller places; and this without any sanitary work and with aegypti abundant.

Only a few months intervened between the inauguration of this intensive program and the perfection of the viscerotome, an instrument for the rapid removal of pathological specimens post-mortem without autopsy [10] which made possible the extension of the routine collection of liver tissue from the bodies of persons dying in 10 days or less after onset of illness, for the diagnosis of unsuspected yellow fever. Viscerotomy confirmed the absence of yellow fever from Recife, the capital city, but revealed fatal cases in the *regional endemic*, the *endemo-epidemic* and "*non-infectible*" zones! In other words, key-center control in Pernambuco after 7 years' constant application had resulted in the elimination of yellow fever only from the key-centers worked!

The installation of anti-aegypti services in the towns of the eastern part of Pernambuco was followed by the rapid disappearance of positive diagnoses on liver tissue collected in this area. The theory of key-center control only needed application to smaller towns than had been previously worked to give the desired results. Not so in the Sertão! The organization of anti-aegypti measures was carried to smaller and smaller centers of population, until villages of less than 50 houses were being worked; but nevertheless, viscerotomy continued to reveal fatal cases in this "*non-infectible*" hinterland. After conclusive proof had been obtained that the disease would not spontaneously disappear from the rural districts, the so-called "fine-tooth-comb" method involving anti-aegypti measures in every home throughout rural districts was authorized for the Sertão. This method eventually gave satisfactory results, and since August, 1934, viscerotomy has failed to reveal yellow fever in Pernambuco or in the 5 neighboring states lying between the São Francisco and Parnahyba Rivers.

It should be noted here that, although Northeast Brazil has been more intensively studied than any other part of South America in recent years, no evidence of the occurrence of yellow fever without *Aëdes aegypti* has been found in that region, and, conversely, the disease has not continued long in those places where the incidence of this mosquito has been reduced by control measures.

The reason underlying the success of anti-aegypti measures limited to the cities and towns in the coastal plain and the failure of the same measures limited to towns in the interior merits discussion. Investigation has shown that the *Aëdes aegypti* mosquito, although widely disseminated throughout the towns and villages of the coastal plain, is not common in the rural habitations of this zone; on the other hand, the dry interior is unique among all the districts investigated in Brazil in that there is a high index of infestation with this mosquito in the rural homes

throughout a wide area. This exceptional distribution of *Aëdes aegypti* is attributed to the fact that the dryness of the climate obliges the inhabitants to store whatever water is to be had for domestic use. The containers used for storing water provide ideal breeding places for *Aëdes aegypti* once it has been introduced, and the custom, bred of necessity, among those travelling on business and on religious pilgrimages, of carrying drinking water containers, has provided the means of such almost universal introduction.

The experience in Northeast Brazil has confirmed the opinion expressed in the report of the Commissão Sanitaria Federal (*vide supra*) that yellow fever will not obey the epidemiological rules in the face of an unusual dissemination of *Aëdes aegypti* but has shown that the extension of anti-aegypti measures to strictly rural regions is practicable and efficacious. No evidence of the presence of yellow fever has been found in Northeast Brazil for more than 2 years, and control measures could probably be safely abandoned were it not for the danger of reinfection from nearby areas demonstrated to harbor the virus of yellow fever in the absence of aegypti and under conditions for which adequate methods of control have not yet been evolved.

YELLOW FEVER WITHOUT AËDES AEGYPTI

JUNGLE YELLOW FEVER

Although the demonstration in 1928 [11] that the virus of yellow fever can be transmitted in the laboratory by various species of mosquitoes found in Africa, other than *Aedes aegypti,* had been followed, as early as 1929,[12] by a similar demonstration for some of the South American species, it was not until 1932 [13] that the natural occurrence of yellow fever in the absence of aegypti was fully confirmed. The full significance of this first observation of yellow fever without *Aëdes aegypti* in the Valle do Chanaan, Espirito Santo, Brazil, was not understood at the time, since the spontaneous termination of the disease within a few weeks after coming under observation, when a very high percentage of the population of the valley was still non-immune, suggested that this outbreak had probably been due to a temporary excursion of the virus under relatively unfavorable conditions from nearby towns and cities where no yellow fever could be found but where high densities of aegypti and high percentages of immunes were encountered. Later observations of yellow fever without aegypti, to which the name jungle yellow fever has been given,[14] have suggested that it may be the more natural and permanent form of yellow fever and that the aegypti-transmitted type may be a highly exotic type maintained with great difficulty because of the tendency to burn itself out through the exhaustion of non-immune populations.

Scarcely had the outbreak in the Valle do Chanaan been identified when epidemiologists were astounded by an outbreak of yellow fever at Santa Cruz de la Sierra, Bolivia, a town of less than 20,000 population, completely isolated from other larger centers of population, lying in the heart of the continent more than 1,000 kilometers from any focus of infection known during the previous two decades. The Santa Cruz epidemic occurred in the presence of a high density of aegypti and responded rapidly to anti-aegypti measures, but no reasonable explanation of the source of virus for this outbreak was found until viscerotomy revealed some months later that yellow fever was present at San Ramón, a small Indian village of the lowlands of Bolivia, in a region in which *Aëdes aegypti* has not been found!

By 1933, immunity survey results

were available from various parts of the Amazon Valley indicating that yellow fever had not been absent from any large portion of the valley in the previous 20 years during which it had not been recognized. Likewise, independent protection test studies in Colombia [15] had suggested the maintenance of the virus of yellow fever in certain rural regions of the Magdalena Valley. Before the end of the year, viscerotomy had confirmed fatal cases of jungle yellow fever for the Magdalena Valley at Caparrapí and for the Amazon Valley at Lauro Sodré, close to the Brazilian, Colombian, and Peruvian frontiers.

The observations of jungle yellow fever previous to 1934, however, are relatively insignificant in comparison with those made during the years 1934, 1935, and 1936, which have shown that it is a very important epidemiological entity, not only as a factor in the preservation of the yellow fever virus, but also as a cause of illness and death among rural and jungle populations. Even those most intimately in contact with the work on yellow fever were totally unprepared for the rapidly unfolding epidemiological picture of the last 3 years. The events of these years include:

1. The discovery in 1934 of jungle yellow fever, confirmed by clinical observation, autopsy, immunity tests and isolation of the virus with reproduction of the disease in susceptible animals, at Coronel Ponce on the Planalto of Matto Grosso [16] 100 miles east of Cuyabá, the state capital. Yellow fever as an urban disease had been known late in the past century in Cuyabá, but there was no history of its occurrence anywhere in the state during the previous 30 years. An attempt to inculpate Cuyabá, and other towns of the state where high densities of *Aëdes aegypti* exist, as the source of virus for this rural outbreak failed in the face of negative histories substantiated by negative protection test results in the younger age groups of the population of these towns. However, immunity studies made on Indians at Simões Lopes, an isolated government post about 100 miles north of Coronel Ponce, showed high percentages of immunes among all age groups and suggested that the infection of the Planalto came from the jungle areas of the Amazon Valley.

The slow moving outbreak on the Planalto was carefully studied during 1934 and 1935. The scattered population of this region had apparently not been exposed to yellow fever in recent years, since histories of recent illness were obtained from all persons with positive protection tests. Investigation showed that the local popular idea that the new disease was contracted in the fields next to the uncut forest was well founded. The paucity of human population in this area and the time and space distribution of cases make it highly improbable that man was at any time an important source of virus for human infection or was an appreciable factor in the dissemination of the disease from one point to another. Positive protection tests obtained with the sera of wild monkeys [17] indicate that infection in this area has not been limited to human beings.

2. The final proof, by clinical observation, autopsy, and isolation of the virus in susceptible animals, that jungle yellow fever continues endemic in the Muzo region of Colombia, as had been suggested by previous protection test results.[15] Yellow fever was reported in Muzo even during the past century, but its careful differentiation from malaria and relapsing fever, both endemic here, was first made in 1907.[18] Since this early confirmation, cases of yellow fever among the non-immune

laborers brought from the highlands of Colombia to work the famous emerald mines of Muzo have been sufficiently numerous to cause repeated investigations but have not been numerous enough to explain the continued endemicity of the past 30 years in this sparsely populated region. Although *Aedes aegypti* was reported as present in Muzo in 1907, repeated investigations since have failed to confirm its existence anywhere in the area, and a careful reading of the early description leads to the conclusion that the classification was in error.[14] Epidemiologists who investigated Muzo during the quarter of a century following the first description of yellow fever there and before the introduction of the protection test, failed to convince themselves, in the absence of aegypti and of explosive outbreaks involving many cases, that the disease under investigation might be yellow fever! Even Gorgas,[19] following a visit to the mines in 1916, declared that the suspect cases which had caused his visit could not have been yellow fever, since the conditions necessary for endemicity did not exist.

Viscerotomy has resulted in the confirmation of cases at Muzo in March, June, and October, 1934; in December, 1935; and in January, April, and May, 1936. Cases have been limited, so far as is known, to persons who had intimate contact with the forest, only a few cases occurring at a time. The organization of viscerotomy throughout the surrounding region has shown that endemicity is not strictly limited to the immediate vicinity of Muzo but apparently covers a large sparsely populated district on the right bank of the Magdalena River, between this river and the high mountain ranges to the east. The proof that this district harbors endemic jungle yellow fever offers at last an acceptable source of virus for the unexplained outbreaks, occurring after periods of several years of apparent absence of the disease from Colombia, in Bucaramanga in 1923, and in Socorro in 1929, both of which towns are within a short distance of the known endemic district.

Muzo is unique in that it has a definite history of constant endemicity of jungle yellow fever during at least 30 years; it is probable that the recently isolated Muzo strain of virus has not been transmitted by the *Aëdes aegypti* mosquito during this period.

3. The identification of a rural epidemic in 1934 on the eastern slope of the Andes at Restrepo, just at the edge of the llanos in Colombia, as yellow fever. This general region, which lies in the drainage basin of the Orinoco River, had in 1886 suffered [6] an outbreak suspected of being yellow fever, but there was no historical reason for believing this to be an endemic region. Careful investigation has shown that even the larger towns of the region are not even now infested with aegypti, and although cases have continued to be recorded during the years 1935 and 1936, some of which have apparently been infected almost at the edge of the towns, no cases are known to have been infected in the towns themselves.

4. The diagnosis, through viscerotomy, of 4 isolated cases—1 in May, 1 in June, and 1 in July, 1934, and 1 in May, 1935—within a comparatively small area on the Ilha Marajo, the large island lying at the mouth of the Amazon River.[20] Careful investigation has indicated that some undiagnosed cases may have occurred, but has failed to bring any clinical cases under observation. The circumstances strongly suggest that there is some reservoir of virus in this region quite independent of the human population.

5. The demonstration that the anti-aegypti campaign, begun in the lowlands

of Bolivia in 1932 at Santa Cruz de la Sierra, had probably not had any important effect in limiting the distribution of the jungle virus, although only 1 case was diagnosed by viscerotomy in Bolivia in 1933, and none were found during 1934. Yellow fever without aegypti was shown to be present in the war zone south of Santa Cruz in 1935. The present year, 1936, has been a banner year for viscerotomy in Bolivia, and diagnosis of yellow fever based on liver examination has been made at numerous points on all sides of Santa Cruz, at many places in the foothills of the Andes, at San Ramón and San Javier in the San Miguel River Valley, at Trinidad on the River Mamoré, at Huichini, on the River Beni, and at Cobija, on the frontier of the Territory of Acre, Brazil.

6. The observation during 1935 and 1936 of an extensive outbreak of jungle yellow fever involving the southern part of Goyaz, the western and southwestern parts of Minas Geraes, a large part of the state of São Paulo, the northern part of Paraná, and the southern part of Matto Grosso. Most of the territory covered by this outbreak had never previously reported yellow fever, and none of it was known to have produced cases during more than a quarter of a century. The area is far from uniform in topography and density of population, and ranges from sparsely settled regions where there are a few settlers along the river valleys, to very rich densely populated districts. The known infected district covers several hundred thousand square miles; it is impossible even to hazard a guess as to the number of cases which have occurred, beyond stating that it is known to be in the thousands. This is by far the most important and extensive outbreak of jungle yellow fever yet observed and is responsible for a new conception of the threat this disease represents for rural populations throughout much of South America.

7. The occurrence of small isolated outbreaks of aegypti-transmitted yellow fever under circumstances strongly suggesting that the virus for the production of such outbreaks had come from nearby areas of jungle infection. Outstanding examples of such outbreaks are that of Theofilo Ottoni in the state of Matto Grosso, Brazil, in 1935,[20] and that of Cambará, in the state of Paraná, in 1936.

DISCUSSION OF JUNGLE YELLOW FEVER

There is ample reason for believing that aegypti-transmitted yellow fever and jungle yellow fever are identical except for the conditions under which infection occurs. The identity of the disease occurring in the absence of aegypti in the Valle do Chanaan, in Matto Grosso, in Goyaz and in both the Magdalena and Orinoco River Valleys in Colombia, has been fully established by clinical observation, autopsy, protection test, and isolation of the causative virus with reproduction of the disease in susceptible animals. Furthermore, the jungle virus has been transmitted from monkey to monkey in the laboratory by the *Aëdes aegypti* mosquito [21] just as the urban virus has been transmitted by various jungle mosquitoes. Aegypti-transmitted yellow fever is largely a house disease, since the vector breeds and spends its entire life either in or in immediate proximity to human habitation; the close contact between vector and cases in the home results in building up a high concentration of virus in the vector; thus most of the non-immune members of the household become infected before the disease dies out because of a shortage of new cases to infect succeeding generations of the short lived vector.

In jungle yellow fever, on the other hand, man is not an important source

of virus for the infection of human cases; the human case is apparently an accident in the course of some as yet unknown extra-domiciliary cycle of infection. In support of this idea, studies of immunity distribution in wild animals in South America have already shown that animals of various types,[14, 17, 22] including opossums and several species of monkeys, may acquire immunity under natural conditions in the jungle.

Much further study is necessary before the entire story can be known; the demonstration of one cycle of infection in the jungle should not be interpreted to exclude other cycles, and a thorough search must be made for all possible blood-sucking vectors and all possible vertebrate hosts. The possibility of virus reservoirs consisting of long lived vectors, vectors capable of transmitting the virus from generation to generation, or even vertebrates incapable of acquiring immunity and therefore permanent reservoirs of the virus, when once infected, must be investigated.

The questions most frequently asked by those who learn for the first time of the recent developments in the epidemiology of yellow fever are, "Is jungle yellow fever a recent adaptation of the virus of yellow fever to non-domestic conditions?" and "If not a recent development, how could jungle yellow fever escape observation and description in the past?"

The answer to these two questions is that jungle yellow fever is not a recent adaptation but may even be the original and natural form of yellow fever and that it did not entirely escape observation and description in the past. There are two quite convincing descriptions of yellow fever from former times and a third, published many years after the observations on which it is based, which undoubtedly refer to what is now known as jungle yellow fever.

The first description of this kind which has come to my attention is the report[23] of an investigation made in 1887 among the Catholic missions along the foothills of the Andes south of Santa Cruz de la Sierra, Bolivia. A series of cases diagnosed as yellow fever by a clinician familiar with the disease in Cuba, is described at Abapó, El Espiño, Muchirí, and Masaví, in exactly the same region in which yellow fever without aegypti was encountered among the troops in the trenches in 1935. Quite naturally this early report carries no reference to the presence or absence of *Aëdes aegypti*, since it was written some 13 years before the transmission of yellow fever by this mosquito was first demonstrated. The authors realized that their diagnosis would be criticised and probably not accepted, as indeed it was not, no reference to this report reaching the international literature until after the discovery of yellow fever in Santa Cruz in 1932. To quote in translation from the Spanish:

> Without doubt many authorities will be unwilling to admit the presence of yellow fever, isolated in the heart of Bolivia, far from the places in which yellow fever generally exists and without known routes of penetration from without.

These words fittingly describe the difficulties of accepting the same diagnosis in this same area 45 years later. That this last outbreak should not have been unexpected is suggested by the fact that the 1887 epidemic was apparently not the first. To quote in translation:

> The older inhabitants state that Abapó was stricken some 20 years ago by a disease which presented these same symptoms and which Dr. José Lorenzo Sanchez, who was then in charge of the local parish, called yellow fever. Likewise this year, it was a priest who announced the true name of the disease. The virtuous Señor Sarrazona, the priest at Abapó, who was to be one of the first to

pay tribute to the scourge, styled it, as a good Spaniard would, Black Vomit.

The second description of jungle yellow fever is that made at Muzo, Colombia, in 1907.[18] The careful clinical observations then recorded do not permit any doubt that yellow fever was present and the epidemiological notes point conclusively to jungle yellow fever. To quote in translation:

(a) It is contracted in the forest and not in the neighborhood of the houses.

(b) It is transmitted by *Stegomyia calopus* and probably also by other culicines.

(c) Inoculation takes place during the daylight hours, which are spent by the workers in places where the transmitting mosquitoes predominate.

Except for the statement that "*Stegomyia calopus*" (*Aëdes aegypti*) was present, the description of yellow fever as given for Muzo in 1907 can stand as a true description of the jungle yellow fever observed there in 1934, 1935, and 1936. That the mosquitoes diagnosed as *Stegomyia calopus* were not *Aëdes aegypti* is clearly indicated by the description of the habits of these mosquitoes and the failure of numerous investigations between 1916 and 1936 (*vide supra*) to reveal this mosquito at Muzo.

In addition to these descriptions there is the reference made in 1929 [24] to two outbreaks many years before in the State of São Paulo, Brazil, reputed to have occurred in the absence of aegypti. This reference, made several years before the observations in the Valle do Chanaan, is very interesting in that it describes so closely the conditions under which jungle yellow fever has recently been found.

The first of these outbreaks, of which I know only from the reports of others, occurred in an Indian village on the Rio Verde. In the other case which I personally investigated, yellow fever was found in some huts built in the midst of the forest and inhabited by laborers. These men were cutting the forest in preparation for the construction of a railroad which was to join Funil to Campinas. I examined several huts from which had come cases of yellow fever, without finding any trace of larvae or adults of *Stegomyia,* although forest mosquitoes were present. This observation is especially interesting since it has lately been shown in Africa that transmission may occur through mosquitoes other than the domesticated stegomyia. This latter will always be among us the most important vector and the transmission by other species must be rare and exceptional, but nevertheless the determination of other species which may transmit the virus is an interesting problem.

During the last few years, *Aëdes aegypti* has not been the most important vector but may be expected rapidly to regain its dominant position should anti-aegypti measures be abandoned. Paradoxically, one of the most important results of the observation of endemicity without aegypti has been to emphasize the need of permanent anti-aegypti services throughout endemic areas and in regions in close contact with endemic areas. And today it is true that the entire continent is, through the development of rapid transportation facilities, in close contact with endemic areas. With present facilities it would be possible for the members of this Association to leave New Orleans, visit a known infected region, probably seeing active cases, and return to the United States, all within the generally accepted 6 day incubation period of yellow fever. The situation is not one calling for undue alarm, but it is one which merits careful evaluation of the implied threat of possible extension of infection.

SUMMARY

Work during recent years in South America has shown that—

1. Elimination of yellow fever from the larger "key-centers" of population by anti-mosquito measures will not result in the disappearance of the disease from the continent.

2. Aegypti-transmitted yellow fever may, under the conditions prevailing in Northeast Brazil, maintain itself for long periods of time as a rural disease requiring organization of anti-aegypti measures in strictly rural districts for its elimination.

3. There exists throughout vast areas of the continent, a previously unsuspected epidemiological type of yellow fever to which the name "jungle yellow fever" has been given. Jungle yellow fever differs from the classical disease in that it occurs in the absence of *Aëdes aegypti*, and under conditions previously considered incompatible with yellow fever endemicity.

4. Jungle yellow fever, in the absence of adequate methods for its control, must be considered as a possible permanent source of virus for the re-infection of cities and towns where high densities of *Aëdes aegypti* are tolerated.

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Efficiency of State and Local Laboratories in the Performance of Serodiagnostic Tests for Syphilis*

MORE than a year ago the Committee on Evaluation of Serodiagnostic Tests for Syphilis reported the results of its first study.[1] This report recorded the ability of several of the outstanding serologists in the United States to perform tests which they had originated or to perform preëxisting tests, which they had modified. The efficiency of the performance of the tests of these serologists was evaluated on the basis of sensitivity and specificity. In the conclusions of the report, the committee stated that it recognized that the actual serologic testing had been performed under relatively ideal conditions. Furthermore, it was stated that the results did not necessarily compare with those obtained from the performance of these serologic methods in other laboratories.

In the summer of 1935, notices were published in leading medical journals of the country in which a project was described, the object of which was the evaluation of the reliability of the different serodiagnostic tests for syphilis as performed in state and local laboratories. A number of directors of such laboratories who expressed an interest in the proposed study were invited to participate. Those invited were later requested to designate not more than two tests which they desired to perform for purposes of evaluation.

The number of laboratory directors requesting an invitation to participate in this work was greater than could be included because of the limitation of funds. Thirty-nine directors of state, municipal, or private laboratories expressed a desire to be included in the study. Of these, 30 were selected because of the priority of their requests or because of their strategic position in furthering the program for the control of syphilis in this country. The serologists in 11 state laboratories, 5 municipal laboratories, and 14 private laboratories were extended invitations. Of these, 9 specified the desire to perform only one method and 21 requested that their performance of two methods be evaluated. Thus, 51 performances of 19 separate serodiagnostic methods were available for evaluation. The serodiagnostic procedures and the frequency with which they were performed were as follows:

Eagle flocculation, 1 laboratory
Hinton flocculation, 1 laboratory
Johns flocculation, 1 laboratory
Kahn presumptive flocculation, 2 laboratories
Kahn standard flocculation, 12 laboratories
Kline diagnostic flocculation, 7 laboratories
Kline exclusion flocculation, 2 laboratories
Kolmer complement-fixation, 14 laboratories

* Report of the Committee on Evaluation of Serodiagnostic Tests for Syphilis, of the U. S. Public Health Service. Read at a Joint Session of the Health Officers, Epidemiology, and Laboratory Sections of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936.

The originator of each of these serologic methods performed an examination on a comparable sample of blood in order that the study might be properly controlled.

The remaining 11 performances comprised a heterogeneous group of serologic tests which had not been given consideration in the first study to evaluate serodiagnostic tests for syphilis. These included the following methods:

Bellevue Hospital complement-fixation, 1 laboratory
Eagle complement-fixation, 1 laboratory
Meinicke clarification reaction, 1 laboratory
Micro-Hinton flocculation, 1 laboratory
New York State complement-fixation, 1 laboratory
Modified Rosenthal micro-flocculation, 1 laboratory
Other modifications of the complement-fixation method, 5 laboratories.

With the exception of the Eagle complement-fixation and the Micro-Hinton flocculation tests no control examinations were made for comparison with the 11 methods in the heterogeneous group.

The procedure followed in the collection and transportation of specimens was the same as that which was described for the original study [2] except that the groups and numbers of donors were more limited. Blood specimens were selected from only two groups—approximately 200 specimens were from known syphilitic donors and approximately 100 from normal presumably nonsyphilitic donors. Each group of syphilitic donors included about 10 with untreated secondary syphilis and approximately 190 syphilitic patients who had received varying amounts of treatment. A total of approximately 300 blood specimens was, therefore, submitted to each of the participating serologists in the state and local laboratories. Comparable samples were submitted simultaneously to those performing the control tests as described above. Thus, a total of 18,840 samples was distributed to the 39 serologists performing the 19 tests.

Because of the practical difficulties encountered in distributing comparable samples to all participants at the same time, it was found necessary to establish 4 separate groups of serologists. The serologists in each group received comparable samples from the same series of donors. Thus, in the tables and graphs which follow, it is possible only to evaluate the performance of any given test with regard to its sensitivity and specificity as compared with other performances from the same series of donors. It is, therefore, obvious that no comparisons can be drawn between the percentages of sensitivity and specificity of the methods employed in the 4 different series as shown in the tables and graphs, or between those found in the results of the first evaluation study.[1]

The specimens for the evaluation of a given test were taken in such quantity as to provide a comparable sample for all laboratories performing that test. Whole blood specimens were collected in dry sterile glass syringes under aseptic conditions, transferred to uniform glass tubes, and stoppered with sterile corks. All laboratories performing two tests were requested to perform only one test on a single sample. An additional sample from a different series was furnished for the second test and each was designated by a code letter in order that there might be no confusion in identification.

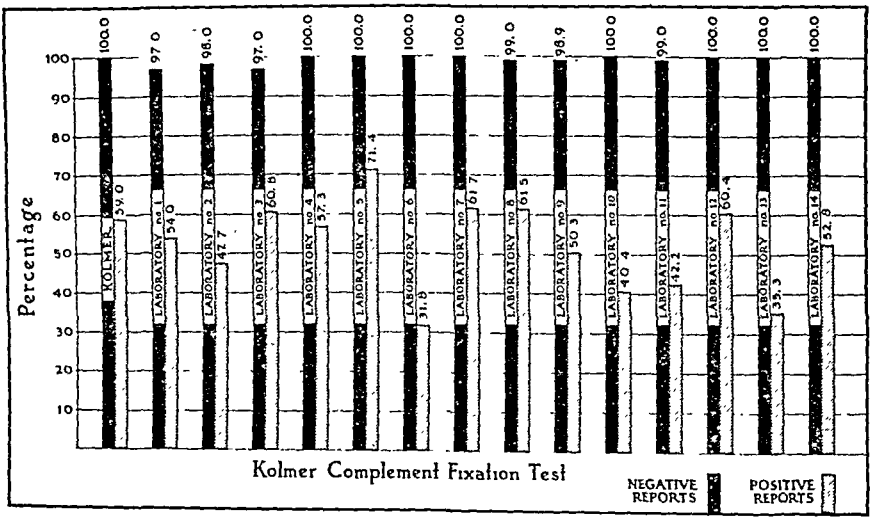
The donors were carefully chosen, and accurate records were made of the pertinent facts in the history and physical examination. Reasonable care was taken to insure that donors would be available for clinical reëxamination in the event that discrepancies existed in the reports of the participants. When more than half of the serologic reports

TABLE I—The sensitivity of serodiagnostic tests for syphilis in Series I (Kolmer complement-fixation test) based upon their ability to detect syphilis in blood specimens from 10 cases of untreated secondary syphilis and 190 cases of syphilis with varying amounts of treatment, and the specificity of serodiagnostic tests for syphilis in Series I based upon their ability to exclude syphilis in 100 blood specimens for normal, presumably nonsyphilitic individuals

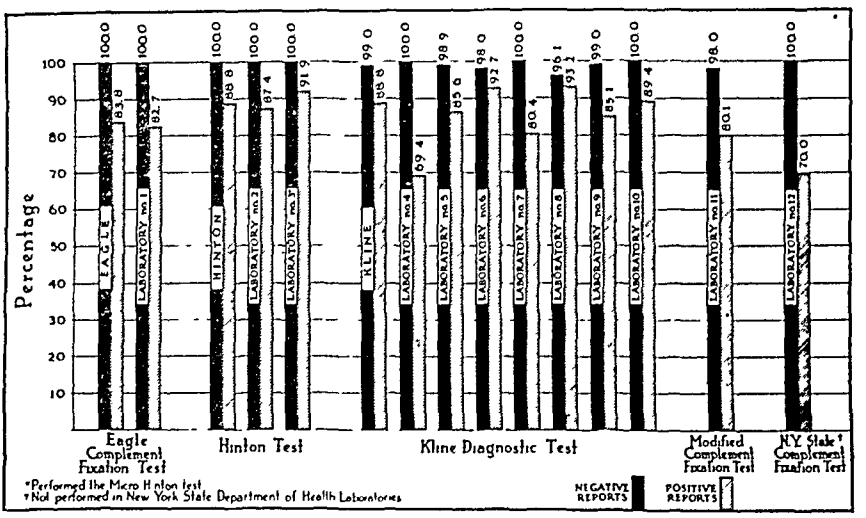
	Sensitivity						*Specificity*						
	Total Patients with Syphilis (200)						*Normal Presumably nonsyphilitic Individuals (100)*						
Participating Laboratories	*Specimens Examined*	*Doubtful Reports*	*Positive Reports*	*Percentage of Positive Reports*	*Specimens Hemolyzed or Physically Damaged*	*Anticomplementary Specimens*	*Specimens Examined*	*Doubtful Reports*	*False Positive Reports*	*Percentage of False Positive Reports*	*Percentage of Negative Reports*	*Specimens Hemolyzed or Physically Damaged*	*Anticomplementary Specimens*
Kolmer complement-fixation test:													
Control *	200	1	118	59.0	..	..	100	..	..		100.00	..	..
No. 1	200	8	108	54.0	.	..	100	7	3	3.00	97.00	..	..
No. 2	199	..	95	47.7	1	..	100	..	2	2.00	98.00	..	..
No. 3	199	4	121	60.8	1	..	99	..	3	3.03	96.97	1	..
No. 4	199	8	114	57.3	1	5	99	3	..		100.00	1	1
No. 5	199	1	142	71.4	1	13	99	2	..		100.00	1	1
No. 6	198	4	63	31.8	2	1	100	..	..		100.00	..	..
No. 7	193	11	119	61.7	7	3	99	2	..		100.00	1	2
No. 8	200	1	123	61.5	..	..	99	..	1	1.01	98.99	1	..
No. 9	183	2	92	50.3	17	3	90	..	1	1.11	98.89	10	..
No. 10	198	15	80	40.4	2	..	100	1	..		100.00	..	..
No. 11	199	7	84	42.2	1	1	100	..	1	1.00	99.00	..	..
No. 12	192	..	116	60.4	8	3	99	..	..		100.00	1	..
No. 13	190	23	67	35.3	10	..	98	..	..		100.00	2	..
No. 14	199	8	105	52.8	1	1	95	1	..		100.00	5	..

* Performed by John A. Kolmer, Philadelphia, Pa.

SENSITIVITY OF BLOOD TESTS IN SERIES I
BASED ON THE PERCENTAGE OF POSITIVE REPORTS IN A GROUP OF 200 PATIENTS WITH SYPHILIS CONTRASTED WITH THE SPECIFICITY OF BLOOD TESTS BASED ON THE PERCENTAGE OF NEGATIVE REPORTS IN A GROUP OF 100 NORMAL PRESUMABLY NONSYPHILITIC INDIVIDUALS



SENSITIVITY OF BLOOD TESTS IN SERIES II
BASED ON THE PERCENTAGE OF POSITIVE REPORTS IN A GROUP OF 213 PATIENTS WITH SYPHILIS CONTRASTED WITH THE SPECIFICITY OF BLOOD TESTS BASED ON THE PERCENTAGE OF NEGATIVE REPORTS IN A GROUP OF 103 NORMAL PRESUMABLY NONSYPHILITIC INDIVIDUALS



on a specimen of blood from a patient suspected of having syphilis were negative, the patient, with a few exceptions, was subjected to a thorough clinical reexamination and to any indicated special examinations. The donors in the normal presumably nonsyphilitic group on whom more than one positive or more than two doubtful results were reported were serologically reëxamined by the participating serologists and given a clinical reëxamination by one or more syphilologists. Only the original serologic report was considered in computing the percentage of negative reports.

The committee has found the evaluation of doubtful reports impracticable. A logical method is lacking for determining the amount of credit to be assigned or the deduction to be made in respect to such reports. There was no general agreement in the proposals offered by the participating serologists in the first study for the evaluation of doubtful reports. Throughout this study specimens giving doubtful reactions are included in the columns headed "specimens examined" but are not counted as positive or partially positive reports in determining percentages of positive reports or percentages of negative reports. Although in this study the doubtful reports have been given a negative rating, the committee recognizes that in clinical practice a doubtful report may often be of value.

The committee decided that in the publication of the results obtained by the participating serologists in state and local laboratories the names of the serologists and laboratories would not be published but would be designated by an arbitrarily chosen number. The director of each laboratory, however, has been furnished with the clinical diagnosis of each donor and with the results of the control serologic test compared with the results obtained in his laboratory. He has also been provided with the results obtained by other unidentified serologists who tested comparable specimens in the same series. Thus, the laboratory director is able not only to compare the results of the serologic testing in his laboratory with

the control performance, but also to correlate the serologic findings with the clinical diagnoses.

EVALUATION OF SENSITIVITY

The results obtained from the serologic testing of blood specimens from syphilitic donors permit a determination of the degree of sensitivity of the various serologic procedures in the same series. The percentage of positive reports on the different tests performed by each of the 15 serologists in Series I to IV will be found in Tables and Graphs I to IV. The percentage of positive reports was obtained by dividing the number of positive reports by the total number of samples examined. The samples examined by each serologist represented the total number submitted in each series of syphilitic donors less the number reported as hemolyzed, as physically damaged, or as not received.

EVALUATION OF SPECIFICITY

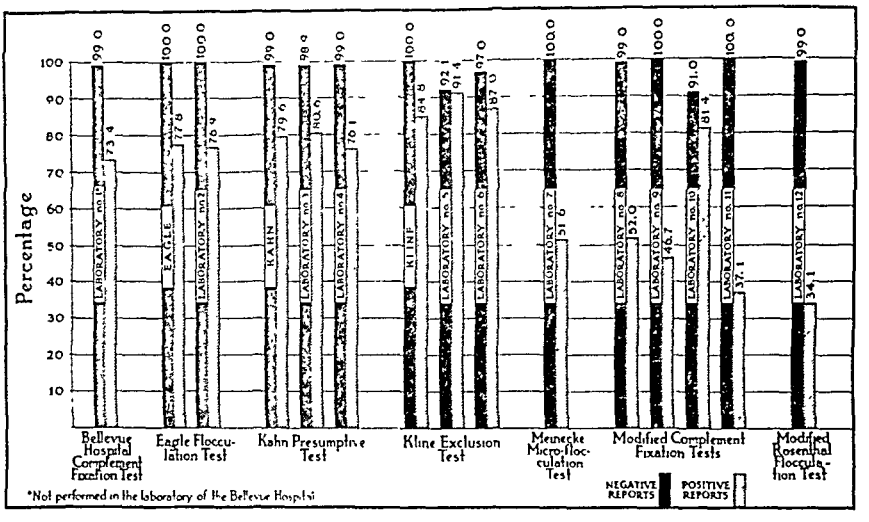
The specificity of the various serologic tests has been determined from the

TABLE II—The sensitivity of serodiagnostic tests for syphilis in Series II (Eagle complement-fixation test, Hinton test, Kline diagnostic test, Modified complement-fixation test, and New York State complement-fixation test) based upon their ability to detect syphilis in blood specimens from 12 cases of untreated secondary syphilis and 201 cases of syphilis with varying amounts of treatment, and the specificity of serodiagnostic tests for syphilis in Series II based upon their ability to exclude syphilis in 103 blood specimens for normal presumably nonsyphilitic individuals

	Sensitivity						*Specificity*						
	Total Patients with Syphilis (213)						*Normal Presumably nonsyphilitic Individuals (103)*						
Test Performed—Participating Laboratories	*Specimens Examined*	*Doubtful Reports*	*Positive Reports*	*Percentage of Positive Reports*	*Specimens Hemolyzed or Physically Damaged*	*Anticomplementary Specimens*	*Specimens Examined*	*Doubtful Reports*	*False Positive Reports*	*Percentage of False Positive Reports*	*Percentage of Negative Reports*	*Specimens Hemolyzed or Physically Damaged*	*Anticomplementary Specimens*
Eagle complement-fixation test:													
Control (a)	204	8	171	83.8	9	1	102	..	..		100.00	1	..
No. 1	197	..	163	82.7	16	1	102	..	..		100.00	1	..
Hinton test:													
Control (b)	197	5	175	88.8	16	..	100	..	..		100.00	3	..
No. 2	207	2	181	87.4	6	..	103	1	..		100.00	..	..
No. 3 (c)	211	2	194	91.9	2	..	100	.	..		100.00	3	..
Kline Diagnostic test:													
Control (d)	205	10	182	88.8	8	..	103	1	1	.97	99.03	..	..
No. 4	209	1	145	69.4	4	..	103	1	..		100.00	..	..
No. 5	208	18	178	85.6	5	..	90	2	1	1.11	98.89	13	..
No. 6	205	2	190	92.7	8	..	103	..	2	1.94	98.06	..	..
No. 7	209	22	168	80.4	4	..	103	1	..		100.00	..	..
No. 8	207	5	193	93.2	6	..	103	1	4	3.88	96.12	..	..
No. 9	208	17	177	83.1	5	..	103	2	1	.97	99.03	..	..
No. 10	207	11	185	89.4	6	..	102	2	..		100.00	1	..
Modified complement-fixation test:													
No. 11	211	6	169	80.1	2	..	102	6	2	1.96	98.04	1	1
New York State complement-fixation test:													
No. 12 (e)	207	15	145	70.0	6	1	102	2	..		100.00	1	..

(a) Performed by Harry Eagle, Philadelphia, Pa. (b) Performed by William A. Hinton, Boston, Mass. (c) Performed the Micro-Hinton test. (d) Performed by B. S. Kline, Cleveland, Ohio. (e) Not performed. in New York State Dept. of Health Laboratories.

SENSITIVITY OF BLOOD TESTS IN SERIES III
BASED ON THE PERCENTAGE OF POSITIVE REPORTS IN A GROUP OF 186 PATIENTS WITH SYPHILIS CONTRASTED WITH THE SPECIFICITY OF BLOOD TESTS BASED ON THE PERCENTAGE OF NEGATIVE REPORTS IN A GROUP OF 101 NORMAL PRESUMABLY NONSYPHILITIC INDIVIDUALS



results obtained by the serologic testing of blood specimens from normal presumably nonsyphilitic individuals. All of these donors were included in a selected group in which the prevalence of syphilis was believed to be lower than the average for the whole population. The group consisted almost entirely of students and members of the staffs of medical schools and hospitals. The total number of samples examined, the number of false positive reactions reported by the participants, the percentage of false positive reports, and the percentage of negative reports are also given in Tables and Graphs I to IV.

DISCUSSION AND RECOMMENDATIONS

In this undertaking the committee has attempted to meet, more closely than was possible in the first evaluation project, the conditions encountered in ordinary practice. A study of the tables reveals that in some of the state and local laboratories the serologic testing does not compare favorably with the results achieved in the laboratories of the originators of the methods. On the other hand, it is pleasing to note that in other state and local laboratories the results achieved are at least comparable to those obtained with the control tests. Particular attention should be directed to the relative uniformity of the results obtained in practically all of the laboratories in the performance of certain tests. A test of equal efficiency from the standpoint of sensitivity and specificity which yields uniformly successful results in the hands of practically all serologists, is distinctly superior to one which yields less uniform results.

It is quite apparent that the performance of some of the tests in some of the laboratories is inadequate. Obviously, in certain laboratories improvement should be brought about in the performance of well recognized tests, the value of which has been demonstrated in this study and in the first evaluation project. Likewise, some of the tests should either be modified to increase their sensitivity or specificity or both, or be abandoned.

An efficient serodiagnostic test for

syphilis should possess specificity of 100 per cent. Any test which yields even 1 per cent of false positive reactions should be so modified as to increase its specificity, even with some slight sacrifice of sensitivity.

The examination of the clinical records of the presumably syphilitic donors in this study again emphasizes the fact that a serologic diagnosis of syphilis unsupported by history or clinical evidence should never be made on the basis of a single positive blood reaction. The committee found no justification for a diagnosis of syphilis in a number of cases, particularly in one series in which the diagnosis had been based upon a single false positive reaction. The reports of the serologic testing of the blood specimens from these donors were not included in the evaluation. If a positive blood test is obtained

TABLE III—The sensitivity of serodiagnostic tests for syphilis in Series III (Bellevue Hospital complement-fixation test, Eagle flocculation test, Kahn presumptive test, Kline exclusion test, Meinicke micro-flocculation test, 4 modified complement-fixation tests, and modified Rosenthal flocculation test) based upon their ability to detect syphilis in blood specimens from 13 cases of untreated secondary syphilis and 173 cases of syphilis with varying amounts of treatment, and the specificity of serodiagnostic tests for syphilis in Series III based upon their ability to exclude syphilis in 101 blood specimens for normal presumably nonsyphilitic individuals

	Sensitivity						*Specificity*						
	Total Patients with Syphilis (186)						*Normal Presumably nonsyphilitic Individuals (101)*						
Test Performed—Participating Laboratories	*Specimens Examined*	*Doubtful Reports*	*Positive Reports*	*Percentage of Positive Reports*	*Specimens Hemolyzed or Physically Damaged*	*Anticomplementary Specimens*	*Specimens Examined*	*Doubtful Reports*	*False Positive Reports*	*Percentage of False Positive Reports*	*Percentage of Negative Reports*	*Specimens Hemolyzed or Physically Damaged*	*Anticomplementary Specimens*
Bellevue Hospital complement-fixation test:													
No. 1 (a)	184	8	135	73.4	2	14	100	20	1	1.00	99.00	1	9
Eagle flocculation tests:													
Control (b)	185	..	144	77.8	1	..	99	..	..		100.00	2	..
No. 2	186	6	143	76.9	..	..	100	..	..		100.00	1	..
Kahn presumptive test:													
Control (c)	186	5	148	79.6	..	..	98	..	1	1.02	98.98	3	..
No. 3	175	10	141	80.6	11	..	92	6	1	1.09	98.91	9	..
No. 4	184	2	140	76.1	2	..	100	..	1	1.00	99.00	1	..
Kline exclusion test:													
Control (d)	181	14	156	84.8	2	..	101	4	..		100.00	..	..
No. 5	186	7	170	91.4	..	..	101	32	8	7.92	92.08	..	..
No. 6	185	7	161	87.0	1	..	99	3	3	3.03	96.97	2	..
Meinicke micro-flocculation test:													
No. 7	182	24	94	51.6	4	..	99	1	..		100.00	2	..
Modified complement-fixation tests:													
No. 8	179	12	93	52.0	7	1	100	..	1	1.00	99.00	1	..
No. 9	182	11	85	46.7	4	4	100	..	..		100.00	1	..
No. 10	183	2	149	81.4	3	.	100	4	9	9.00	91.00	1	..
No. 11	186	46	69	37.1	..	..	99	1	..		100.00	2	..
Modified Rosenthal flocculation test:													
No. 12	179	22	61	34.1	7	..	100	8	1	1.00	99.00	1	..

(a) Not performed in the laboratory of the Bellevue Hospital. (b) Performed by Harry Eagle, Philadelphia, Pa. (c) Performed by M. B. Kurtz, Lansing, Mich. (d) Performed by Charles R. Rein, New York, N. Y.

SENSITIVITY OF BLOOD TESTS IN SERIES IV
BASED ON THE PERCENTAGE OF POSITIVE REPORTS IN A GROUP OF 202 PATIENTS WITH SYPHILIS CONTRASTED WITH THE SPECIFICITY OF BLOOD TESTS BASED ON THE PERCENTAGE OF NEGATIVE REPORTS IN A GROUP OF 100 NORMAL PRESUMABLY NONSYPHILITIC INDIVIDUALS

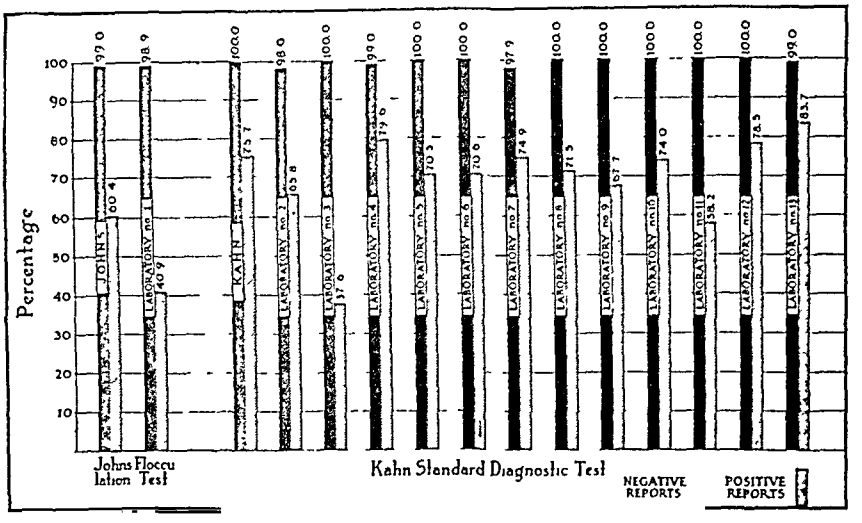


TABLE IV—The sensitivity of serodiagnostic tests for syphilis in Series IV (Johns flocculation test and Kahn standard test) based upon their ability to detect syphilis in blood specimens from 10 cases of untreated secondary syphilis and 192 cases of syphilis with varying amounts of treatment, and the specificity of serodiagnostic tests for syphilis in Series IV based upon their ability to exclude syphilis in 100 blood specimens for normal presumably nonsyphilitic individuals

	Sensitivity						*Specificity*						
	Total Patients with Syphilis (202)						*Normal Presumably nonsyphilitic Individuals (100)*						
Test Performed—Participating Laboratories	*Specimens Examined*	*Doubtful Reports*	*Positive Reports*	*Percentage of Positive Reports*	*Specimens Hemolyzed or Physically Damaged*	*Anticomplementary Specimens*	*Specimens Examined*	*Doubtful Reports*	*False Positive Reports*	*Percentage of False Positive Reports*	*Percentage of Negative Reports*	*Specimens Hemolyzed or Physically Damaged*	*Anticomplementary Specimens*
Johns flocculation test:													
Control (a)	197	..	119	60.4	5	..	99	..	1	1.01	98.99	1	..
No. 1	198	16	81	40.9	4	..	94	1	1	1.06	98.94	6	..
Kahn standard diagnostic test:													
Control (b)	202	3	153	75.7	..	..	99	1	..		100.00	1	..
No. 2	199	11	131	65.8	3	..	100	4	2	2.00	98.00	..	..
No. 3	189	22	71	37.6	13	..	99	1	..		100.00	1	..
No. 4	196	2	156	79 6	6	..	97	3	1	1.03	98.97	3	..
No. 5	200	13	141	70.5	2	..	100	..	..		100.00	..	..
No. 6	197	11	139	70.6	5	..	98	1	..		100.00	2	..
No. 7	195	18	146	74.9	7	..	96	1	2	2.08	97.92	4	..
No. 8	200	9	143	71.5	2	..	100	2	..		100.00	..	..
No. 9	198	4	134	67.7	4	..	100	..	..		100.00	..	..
No. 10	196	..	145	74.0	6	..	100	..	..		100.00	..	..
No. 11	194	14	113	58.2	8	..	94	..	..		100.00	6	..
No. 12	200	6	157	78.5	2	..	100	2	..		100.00	..	..
No. 13	202	7	169	83.7	..	..	100	..	1	1.00	99.00	..	..

(a) Performed by F. M. Johns, New Orleans, La. (b) Performed by Reuben L. Kahn, Ann Arbor, Mich.

in a person who presents no history or clinical evidence of syphilis, the test should be repeated in the same laboratory, or in another laboratory, utilizing two or more different tests.

The studies made by this committee show that if two tests are to be performed, it is immaterial whether two efficient complement-fixation tests, two efficient flocculation tests, or a combination of one efficient flocculation test and one efficient complement-fixation test is selected. As in the first evaluation project, this study again indicates relatively equal value to the clinician of efficient complement-fixation tests and efficient flocculation tests as applied to blood specimens.

The experience of the committee shows that it is satisfactory to report the results of qualitative tests as merely positive, doubtful, or negative. In this way the confusion arising from the use of various symbols is avoided.

The directors of laboratories performing serodiagnostic tests for syphilis should have, and should avail themselves of, the opportunity of comparing their results with those of well qualified serologists in other laboratories performing the same test on comparable samples from known syphilitic and presumably nonsyphilitic individuals. The committee recommends that such a system of comparative examination of tests be extended annually to all state laboratories. In turn, the state laboratories should offer a similar opportunity to local laboratories.

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SIXTY-SIXTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
New York, N. Y.
October 5–8, 1937

Integration of the Practising Physician into a Venereal Disease Program*

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ONE of the charms of health work for the administrative officer of vision and alertness is the endless vista of possible achievement everlastingly unfolding before him. His creative imagination, however, does not long soar before it receives many rude awakenings from budget limitations and a widespread blight of public indifference, apathy, and ignorance.

In the recent action taken by the federal Congress and incorporated in Titles V and VI of the Social Security Act, we witness the long-entertained aspirations of health workers taking material form, through making available to states, federal subsidies for the specific purpose, not of relieving, but of expanding, existing inadequate state and local health budgets. Upon the wisdom and judgment displayed by the state health officers, to whom the Public Health Service must look for the administration of these subsidies, much of the future success and development of organized health work in this country will depend.

In an effort to make wise use of these additional funds, it becomes at once apparent that each administrative health officer should preserve a broad perspective, viewing his multifarious health problems in their entirety and weighing each in the scales of relative importance to the population group to be served and of the benefits accruing from any expenditure of tax moneys made available for health work.

So widely do health problems vary in different sections of our country, that what for one state looms as a major affair, for another exists not at all. For example, throughout the South, interest in Rocky Mountain spotted fever is largely academic; just as are malaria and hookworm throughout the West and North. However, certain other health hazards for mankind, heedless of geographic or climatic limitations, constitute very definite problems for every health officer; and of these, one of the greatest and most urgent is the need for at least a beginning program for the control of the venereal diseases in every state of the Union.

The financial restrictions to our budgets, mentioned above, can now be lifted, at least in part, through the judicious application of some of the available federal funds to this particular problem. Furthermore, and for us whose responsibility it clearly is to plan the

* Read at a Joint Session of the Health Officers Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936.

fight and lead the onslaught, the sudden reversal of an age-old attitude of "squeamishness" (Parran) and of a "conspiracy of silence" (Moore), on the part of society as a whole, as well as of the moulders of public opinion—the lay press, the radio and the cinema—to bring out into the open these "social diseases," creates the long-wished-for opportunity for health workers of making their first organized frontal attack.

For the membership of this group there is no need for here rehashing scientific and statistical data in justification of our decision to act. Such data are readily accessible and have been so clearly and concisely stated by recognized authorities as to defy improvement. Let it suffice now to state that estimates based upon these statistics point to the fact that 10 per cent of the American people are infected with syphilis. We, as health workers, know a major health problem is all about us; the medical profession likewise knows this; and now that the layman is learning to know this, it behooves us to plan and to organize.

At this juncture, one might inject the thought that, while this particular discussion has been built solely around syphilis, the administrative health officer, in attempting to shape a comprehensive and well rounded venereal disease program, should not lose sight of the agonizing distress and irreparable damage which can be and is being done society by the plebeian, yet potent, gonococcus. His rich harvest of human sterility and blindness cannot be ignored.

In the brief discussion which follows, no attempt will be made to enter into the details of any particular type of administrative program to serve for your guidance. In the present uncrystallized state of our development, no one of us is prepared to come forward with a "model plan" for general adoption. In truth, and for very obvious reasons, one might well question the wisdom of such an attempt. In the published report of "The Advisory Committee to the U. S. Public Health Service," with which members of this group should be entirely familiar, the salient factors to be given consideration in any well conceived program are succinctly set forth. So earnestly and so efficiently has this committee performed this beginning task, that it is felt a word of thanks and commendation, not only from the Sections here represented, but in behalf of the entire membership of the American Public Health Association would be a fitting gesture. Furthermore, of great importance also to the stimulation of interest in this work have been the valuable contributions to the recent literature made by the individual members of this committee.

A program of control for any disease, conceived on a nation-wide basis, would prove to be no small undertaking. The universality of syphilis, its endless social ramifications, its chronicity, its protean nature, and elusiveness, the many difficult aspects of its medical management, the public's crass indifference and want of knowledge, a widespread lack of familiarity on the part of the rank and file of physicians with the newer technics of diagnosis and treatment—these are some of the obstacles which are to be overcome. All of these factors are important; yet some transcend others in importance. To the writer's mind, none is deserving of more consideration than that of evolving sound plans whereby all the latent forces within the practising medical profession may be brought into full play. It must be borne in mind that syphilis is a contagious disease, transmitted most often, save in the congenital type, by direct personal contact, and that all effort at control,

other than rendering the infected case noninfectious through proper and adequate treatment, has proved quite ineffective, if not quite futile.

In the control of no other health problem of major import with which the health official has thus far had to deal, have the factors of *early recognition and approved scientific treatment* played such a tremendous rôle. The peculiar and unquestioned sphere of activity of the practising physician is the treatment of the sick individual. Throughout the country as a whole it is estimated that 65 per cent of the cases of syphilis under treatment are in the hands of private physicians. Potentially, and in actuality, does not this contemplated nation-wide control program against syphilis present the rare opportunity for the amalgamation into a close-knit confederacy of all human forces interested in mankind's uplift? The leaders within the medical profession are acutely aware of the dangers to society lurking in this venereal menace, and are eager to see evolved a program of such vision and breadth as will permit of full utilization of their profession's talent.

The more complex our social structure becomes, the more apparent it also becomes that there need not be—there must not be—even a semblance of dichotomy of the forces of medicine and of health. Both are but the trained implements of society, having a common parentage and a common goal. If the premise be granted that the control of syphilis is a health problem justifying the expenditure of tax moneys, then it should logically follow that health administrators who are to be held responsible for shaping and administering programs of control should see that such programs are broad-based and sound and as inclusive as possible. In order to make them so, a most important first approach is participation in an active and financial way, of those members of the practising medical profession manifesting a distinct interest and a willingness to devote a certain portion of their time and study to such a program. There will likely be many physicians whose absorption in other fields of endeavor or whose personal inclinations, training, or tastes would not prompt active participation; yet, who would welcome relief from a venereal burden which, perforce, they are now reluctantly carrying, were they assured of adequate scientific care for those of their clientele needing it. In truth, there are many physicians who conscientiously feel that, because of the technics to be employed and because of the persistent and long-continued treatment necessary to effect a cure, venereal cases should rightfully be handled by those sufficiently interested to master such technics. However, for all physicians, including the group mentioned above, our initial plans should incorporate means for taking to them, through all ethical avenues of approach, the newer knowledge and approved technics in diagnosis and treatment.

Every practitioner must be impressed, when confronted with a suspicious lesion anywhere on the body, and more particularly when appearing on the genitals, of the danger of temporizing measures and of the value of darkfield and serological examinations. Already, through postgraduate and refresher courses, sponsored by state and county medical societies, he has been made conscious of the dangers lurking in dilatoriness when dealing with acute abdominal conditions, obstetrical emergencies, suspected tuberculosis, and precancerous lesions; but thus far little stress has been laid upon these important things when a possible early case of syphilis presents. Because of these efforts on the part of organized medicine and also because of the fact that the product of the modern

medical school which today enters upon the practice of medicine is being better trained in the preventive aspects of disease, physicians as a whole are thinking more and more in terms of prevention as well as of cure, and consequently should be relied upon to give wholehearted support to a coöperative program such as the one now under contemplation.

Within each central health department, therefore, adequate provision should first be made for carrying to the rank and file of the profession this much needed information. If this approach is properly and tactfully made, incorporating, at the same time, into the practical application of the program, provision for the financial participation of interested doctors, we will quickly witness, I believe, a renaissance within the profession toward the venereal diseases.

The ultimate goal of such a professional educative endeavor should be the development within and throughout the profession in each state, not of specialists in the strict sense of the term, but of many physicians, partially but soundly trained in venereal disease rudiments and capable of assuming responsibility in official programs which might be sponsored for their communities. It is to be hoped that, as organization for this work becomes perfected, provision can be made for the development of much of this latent talent within the practising profession, through the use of short intensive courses in the larger teaching centers.

Synchronously, and hand in hand with the profession's educational program, should go the making readily and easily available adequate laboratory facilities of which physicians are to be taught and encouraged to make free use. Following through with the premise previously stated that the control of syphilis is a legitimate public health function, it clearly becomes the responsibility of the administrative official to provide such facilities, in so far as budgetary limitations will permit. This means that every effort should be made by health departments to expand their present laboratory facilities so as to be able to give, at as many points as possible, a dependable darkfield and serological service.

In order further to stimulate interest in the early diagnosis of suspicious initial lesions, physicians should be supplied with and encouraged to make use of, the capillary mailing outfit, as now practised by the New York Department of Health. In my own state —Alabama—it has been found that our system of laboratories—9 in number and all under direct state supervision—has proved to be the most highly appreciated service we render, both on the part of the medical profession and of the public. Furthermore, this laboratory service has proved a most valuable adjunct in the elevation of the standards in the general practice of medicine. In the immediate future, we plan to equip as many as possible of the branches with darkfield services in addition to the serological tests which are already available.

In those states having large urban centers, where hospital and clinic facilities and trained medical talent abound, a first logical approach would be, in the interests of greater compactness and efficiency of administration, a fusion of the separate and dissociated facilities already existing. Here, the greatest difficulties, other than the ubiquitously financial ones, are likely to arise from an unwillingness to submerge an independent, individual interest into the whole, for the common good. For the guidance of such as these, a leaf might well be lifted from the recorded history of medical education in this country. At the dawn of

the present century, we boasted 160 medical schools, many of which were both frankly commercial and a bit unsavory. Today we possess but 67, recognized and accredited. These results were attained, not through extraneous compulsion, but through persistent efforts within the medical profession to junk the worthless and preserve and improve the worth while. By the same token, for the successful control of the venereal diseases, just as for the purification and elevation of medical education, there will be needed the powerful forces inherent in organized medicine in order to harmonize and perfect enduring programs.

In the message to be taken to the general profession, the epidemiological aspects of venereal disease control must be iterated and reiterated. Probably the most valuable service which the practising physician can render, after first gaining the confidence of his patient, is to probe to the bottom for the origin of each case with which he has to deal. The epidemic cycle which is prone to characterize cases of syphilis occurring in communities, should act as an added stimulus to his inquisitive mind, already trained in ferreting out difficult and obscure problems. However, the obstacles met in attempting to apply productive epidemiologic technics, even by skilled health workers, are so considerable and time consuming as possibly to dampen the ardor of the individual physician, unless there is placed at his disposal a dependable and functioning unit designed to serve this end. Here, again, is a fertile field of activity, which, if properly rendered, will prove but another means of cementing the medical profession to the sponsored program of the official health agency. This epidemiologic phase of this subject will be presented in detail by another essayist. The importance and value of this particular type of coöperation on the profession's part is so great as to warrant repeated stressing.

Did time permit, there are many other interesting phases of this question, which, from the administrative angle, might be discussed with profit; chief among these would come a sane and carefully thought-through educative program for the general public. But likely none will present in the formative stages of our work of greater significance than that of the full utilization and wise integration of the interested practising physician.

Rôle of Vital Statistics in Medical Science*

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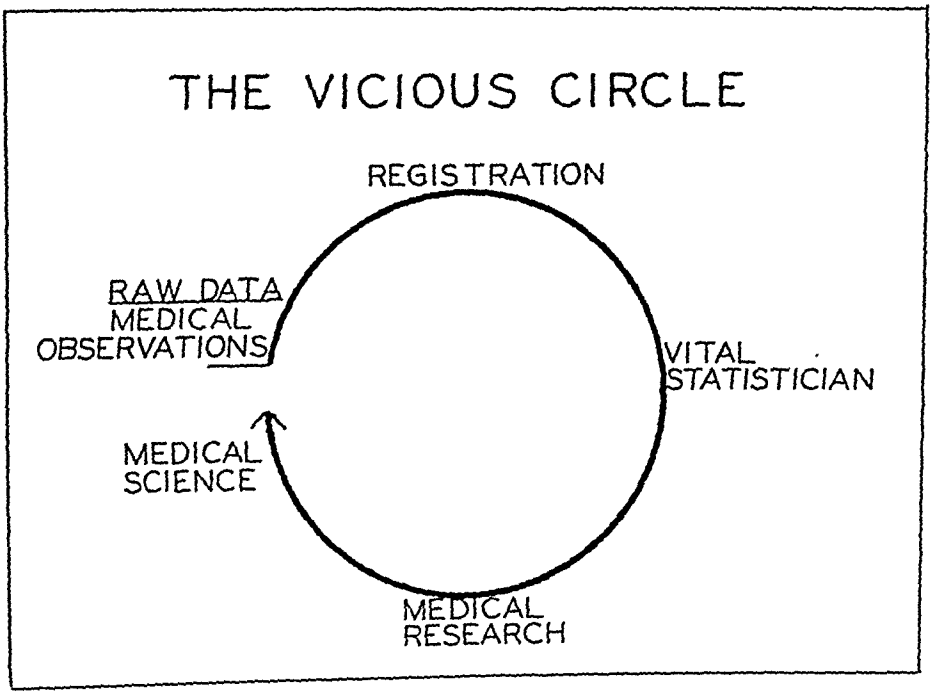
IN considering this title in the preparation of my remarks, I came to the conclusion that vital statisticians were possibly guilty of "wishful thinking" with regard to the rôle of vital statistics in medical science. I am sure that there are many of us who have tried to wring from the regularly recorded vital statistics of urban and rural areas, facts which would be reliable guides in pushing forward a public health program or in influencing medical procedures, only to find that either the important questions which we sought to answer were not a part of the regularly recorded information, the terms used were indefinite, or the information so incomplete as to be worthless.

I decided, therefore, to direct my discussion to the possibilities of vital statistics in influencing medical science rather than discussing the meager contribution which they can make under present conditions.

The chart shown here, I believe, illustrates the usual path which vital records follow in their progress, if any, to contributing to medical science. They begin as medical reports usually of a birth or death or of a disease condition, made primarily because there is a law requiring it and a health department enforcing it, rather than because of great personal interest on the part of the practising physician in contributing his observations to a general pool of medical knowledge. These reports, made in the case of births and deaths to a local registrar, are treated with varying degrees of respect depending upon the interest which the county or state health department, as the case may be, has shown in acquainting local registrars with the potential importance of these records.

Periodically, returns from registrars are collected by city and state vital statisticians and tabulated to show the frequency of occurrence of certain events. Eventually someone concerned with medical research will turn to the regular report or special tabulations of these data for information on a question in which he is particularly interested, or to provide a background against which personal observations may be studied. By this time the character of the individual medical record which forms the basis of the orderly tabulation of events has been completely masked, and such facts as a large proportion of the total deaths occurring without medical attendant and a frequently larger proportion being assigned to unknown and ill defined causes may

* Read before the Vital Statistics Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 20, 1936.



be passed over lightly by the researcher and conclusions drawn which accept at face value the medical observations and the summations as presented as representing a universe of experience.

How, then, can we expect our present vital statistics to make any significant contribution to medical science? We have completed the Birth and the Death Registration Areas, but we are confronted with a more difficult and yet a more important task of raising the qualitative level of the reported material to the point where it will be of value beyond its function of identifying an individual as to date of birth, or the fact and cause of death.

While we are encouraging medical research and the improvement and extension of medical science in every possible way, we are, I believe, doing relatively little to improve the understanding of practising physicians of the contribution which they might possibly make through more careful and complete medical reports. Why should we expect the contribution of vital statisticians to be always clockwise around this circle? Is it not time to consider the possibility of the educational influence working back from the demands of medical science and medical research to the individual physician? To undertake this successfully, I am sure involves a task for many of us to differentiate in our minds and in our approach between the science and the art of medicine. In seeking to encourage a more thoughtful contribution by the private physician via the birth and death and morbidity reports we must realize that he, in the main, is concerned with the art of medicine as it has applied or does apply to his particular patient. We must interpret the possibilities of carefully collected and analyzed material in making available to him information which he may use directly or with only moderate and simple adjustment to guide him in the handling of a particular case.

I am inclined to believe that we have

laid too much emphasis upon the value of the birth and death certificates to the individual or family concerned as proof of age or of death, and have given private physicians little insight into the possibilities which carefully recorded experience might make both to the art and the science of medicine.

As usual, Dr. Chapin in Providence was far ahead of his contemporaries in placing the relation between the department of health and the private physicians in the matter of vital statistics on a sound professional and educational basis. Many of you know that for years, as superintendent of health of the City of Providence, it was Dr. Chapin's practice to read the death certificates each week with his chief clerk, and in all cases of ambiguity or doubt personally to reach the physician concerned by telephone or letter and discuss with him, in a professional manner as one physician to another, the facts in a particular case in order to arrive at the most probable cause of death and hence the proper classification. Such contact unquestionably contributed to the accuracy of the assigned cause of death and was an educational influence for the physicians, giving them an insight into the interest of the department and the possible value of such collected material to medical science.

Health officers today will find the *Standard Classified Nomenclature of Disease*[1] a material aid in improving the accuracy and uniformity of assigned causes on death certificates. This handbook accepted widely by hospitals and private physicians not only readily gives the appropriate terminology of disease but provides also the corresponding classification number of *International List of Causes of Death*.[2]

The activities of the Committee on Stillbirth of the Vital Statistics Section of the A.P.H.A., and of a similar committee of the Canadian Public Health Association indicate the general direction in which we should proceed in adding to our vital statistics records items of direct medical interest.

While the struggle to secure information on added items will be great, the value, particularly if there is increased interpretation to the physicians of the importance of this information by local health authorities, will be enormous.

I appreciate that every demand for additional information on a birth certificate is vigorously opposed on the grounds of lack of space. It is of interest that New York City in its recent revision has met this by using more of the margin and has added questions as to whether the delivery was normal, or spontaneous, or operative, with opportunity for indicating the specific operation and the period of gestation. Can there be any question but that this information is more important to medical science, to health workers, and to future mothers than are the questions relating to occupation, particularly of the father!

Would not the addition of such a question to the birth certificate as " time under medical supervision? " shed important light upon the trend of the public attitude with regard to antepartum care? We do not need to go into detail as to the kinds of questions which would be helpful. Far more will occur to us than we can possibly impose upon the certificate or upon the interest of the private physician. There is definite evidence in the activities of the committees of this Section and in other places that there is increasing interest in improving the character of medical observations reported. I personally doubt if we will be successful in this attempt unless our educational efforts extend both ways—from the vital statistician to the practising physician through the registrars, who in intimate day-to-day contact with the physicians acquaint them with the use

and the possibilities of the information which they have recorded, and forward through medical research and education through universities and through both undergraduate and postgraduate courses indicating the frequency with which basic observations of physicians in private practice, if well recorded, might ultimately contribute to medical science.

To this end, I would advocate a more intimate participation of local health officers in the collection of vital statistics and a definite program in local health departments seeking to increase the accuracy and the comprehensiveness of medical statements on birth, death, and morbidity reports.

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Tuberculin Test for Cattle

INFORMATION received from the Bureau of Animal Industry of the United States Department of Agriculture indicates that 1,944,624 herds, containing 22,918,038 cattle, were tuberculin-tested during the fiscal year 1936, with the result that 165,496 (0.7 per cent) gave a positive reaction to the test and were removed from the herds. At the close of June, 1936, there were 256,056 fully accredited herds, containing 3,746,955 cattle. The total number under supervision in connection with the coöperative tuberculosis eradication project, as of the above date, reveals that there were 6,515,273 herds, with a cattle population of 59,907,935. The total number of cattle that have reacted to the tuberculin test since the coöperative project was launched in the year of 1917 amounts to 3,467,185.

On July 1, 1936, there were 2,921 modified accredited counties, and by virtue of all the counties having been modified accredited within their borders, 40 states were similarly classified, meaning that the incidence of tuberculosis is less than one-half of 1 per cent. It now appears certain that 3 more states will be added to the list of modified accredited states within the next 60 days, bringing the total to 43 states, thus leaving but 5 states to complete their program. Two of these are located in the West and 3 in the eastern section of the country. Another year will witness a material reduction in this number.—Dr. A. E. Wight, Chairman, Special Committee on Tuberculosis, American Veterinary Medical Association, Columbus, Ohio, Aug. 10–13, 1936. *J. Am. Vet. Med. Assn.*, Oct., 1936, p. 455.

Maternal Mortality of the Chicago Maternity Center*

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IT is a privilege to present this paper on maternal mortality before the American Public Health Association. It is a matter of history that many medical discoveries have been applied through public health agencies to decrease substantially the incidence and mortality of disease. It would seem that our American mother dies too quietly and resignedly to jar the mass inertia of the nation. If a sweeping pestilence struck down as many women in a community as are taken in childbirth we would immediately be aroused.

The Children's Bureau has made careful studies of the maternal mortality of the country at large; factors contributing to a fatal outcome in the individual case have been traced and it has been found that the majority of the deaths were preventable. In the light of this knowledge there is considerable hope that the rate may yet be brought to the so-called irreducible minimum. Knowing the causes of maternal death and knowing the methods of prevention, it is your privilege to give your aid to the practising physician in an effort to lower materially the maternal death rate.

In this paper we will endeavor to show how, working under adverse conditions with a group of patients physically below par, and on a minimum budget, the Chicago Maternity Center was able to maintain a gross maternal mortality of 0.142 per cent over the 4 year period July 1, 1932, to June 30, 1936, inclusive. We will emphasize both the strong and the weak points in the service and bring out the factors which if applied to the care of maternity cases throughout the country would undoubtedly favorably influence the general maternal mortality rate.

The Chicago Maternity Center is a large outpatient obstetrical service with facilities so complete that it might well be termed a traveling hospital. Though only 4 years old, the center has inherited the fine obstetrical tradition and principles of its founder, Dr. Joseph B. De Lee, who 40 years ago established the Maxwell Street Dispensary of the Chicago Lying-in Hospital on the same site.

The purposes of the institution are twofold, first to take care of poor women in their homes during confinement, and second to teach doctors, medical students, and nurses the science and art of obstetrics. Of the 2,200,000 babies born in the United States each year, 1,400,000, or 60 per cent, are still born at home. It is therefore necessary to teach doctors and

* A 4 year report—July 1, 1932, to June 30, 1936—read before the Child Hygiene Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936.

nurses how to care for obstetrical patients outside of the hospital.

The center delivers about 3,000 women in their homes each year. The only prerequisite for care is poverty—the inability of the patient to pay a private doctor. Registration early in pregnancy is urged, but fully 15 per cent of the cases are emergency calls which come to us either directly from the patient, the police, or some public or private charity. In addition to conducting prenatal clinics daily at the center, 3 other prenatal stations are maintained in the city. The Chicago Board of Health, the Infant Welfare Society of Chicago, and other agencies likewise conduct prenatal stations and register many cases for delivery by the center.

In this 4 year period, 14,355 women received some type of care either during pregnancy, labor, or the puerperium, in their own homes; 11,772 confinements and 269 abortions were attended at home; 556 women were hospitalized for some complication of pregnancy, 4.4 per cent; 130 of the delivered patients were later hospitalized, 1.1 per cent; 3,363 complications of pregnancy occurred in this series; 673 operative deliveries were performed upon the patients in their homes, an incidence of 6 per cent operative interferences. These were all indicated procedures and included many major operative deliveries, such as the midforcep operation, version and extraction, operative breech delivery, craniotomy, and vaginal Caesarian section; 76 abdominal low Caesarian sections were performed on patients sent into hospitals, an incidence of 1 section to every 154 deliveries; 18 per cent of the patients delivered were primiparae; 33 per cent of the women were colored.

In computing the maternal mortality we have used the figure 12,597. This is the total confinements, abortions, and women referred into hospitals by us for some complication; 1,758 women voluntarily made other arrangements for confinement care. These have not been traced. They either moved out of the city, engaged private physicians, or entered the clinical service of some hospital. They were all in good condition when they left our service. Any mortality with which we have been even remotely connected has been included in this study.

It is very difficult in any completely outpatient obstetrical service to give an accurate picture of the maternal mortality. Few of the patients die in their own homes and some complications are hospitalized before delivery. Again patients may be carried through a complication early in pregnancy and later elect to make different arrangements for confinement care. We have, however, an accurate record of every patient whom we cared for at home and have traced the subsequent course of those patients we referred to hospitals. Every death has been listed occurring at home or in the hospital, at any time during pregnancy, labor, or the puerperium.* Of the 12,597 women cared for, 18 have died, a gross mortality of 0.142 per cent. The causes of death were:

Puerperal sepsis	4
Toxemia	4
Postpartum hemorrhage	2
Tuberculosis	5
Pneumonia	2
Meningitis (torula histolytica)	1

An analysis of these deaths shows that 11 were from obstetric and 7 from non-obstetric causes. Five died undelivered in the last 3 months of pregnancy. Twelve of the confined cases delivered spontaneously and only 1 had operative interference. Five were patients first seen after they had started into

* Puerperium—6 weeks postpartum.

labor or after a complication had arisen. They had had no prenatal care. Autopsies were held on 14, or 83 per-cent, of the cases. Four cases died at home and 14 in hospitals. Fifty per cent of the women were colored. Three were primiparae and 15 multiparae. There were no deaths from abortion.

Considering the causes of death individually, tuberculosis was responsible for more deaths than any other disease. This startling fact serves as an index of the class of patient in the service: a class physically below par and thus more susceptible to the tubercle bacillus. The incidence was 1 tuberculosis death to 2,519 patients. In spite of the fact that 4 out of the 5 patients had attended prenatal clinic, a diagnosis was not made prior to the onset of acute symptoms. Autopsies were held on all. Three died from pulmonary tuberculosis and 2 from tuberculous meningitis.

Puerperal sepsis and toxemia ranked equally as a cause of death. For each there was 1 death for every 3,149 patients. Three of the 4 septic deaths had factors present which were beyond our control. There were no extenuating factors present in the fourth case other than a light respiratory infection. All of the patients delivered sponteneously at home without evidence of visible laceration. A midwife had interfered in 1 case before we were called. Autopsy showed the cause of death in the first patient to be a ruptured pus tube; in the second, gonorrheal peritonitis; in the fourth puerperal sepsis with the causative organism streptococcus hemolyticus. No necropsy was held on the third patient.

Three of the 4 patients who died of toxemia had inadequate prenatal care. The fourth patient first called the dispensary after convulsions had occurred, and upon the arrival of our doctors was in coma. Autopsies showed the cause of death in 2 to be eclampsia. The other 2 deaths occurred in patients belonging to the non-convulsive toxemia group and the cause of death appeared to be cerebral accident. Postpartum hemorrhage accounted for 2 deaths, an incidence of 1 death to 6,298 patients. These women had adequate prenatal care and easy spontaneous delivery. In both, the uterus was explored and packed. Glucose and saline were given and in 1 blood transfusion started. An autopsy was performed on only 1 patient and a partial rupture of the lower uterine segment was found.

Two patients died of pneumonia; the first followed the administration of ether for operative delivery. An autopsy was held. The second had pneumonia at the time of delivery and died 12 hours later. A rare complication accounted for the death of a woman in the 8th month of pregnancy. Autopsy revealed the cause of death to be meningitis with the causative organism a yeast-like form torula histolytica.

A careful survey of the above cases reveals that 7 of the 18 deaths can be directly traced to inadequate prenatal care. Four of the 5 patients suffering from tuberculosis had attended prenatal clinic. If a diagnosis of the disease had been made early in pregnancy by X-ray, different management might have followed with perhaps a more favorable outcome. Likewise, if there had been more adequate follow-up of delinquent patients who had not attended clinic, 3 of the 4 toxemia deaths might have been prevented. In the past 2 years we have a field nurse for this purpose.

In computing these statistics the *International Classification of the Causes of Death,* as described in *Bulletin 223* of the Children's Bureau, Washington, 1934, has not been used. An uncorrected maternal mortality rate gives a more accurate picture of the actual conditions. The gross maternal mortality rate at the center of 0.142 per cent

compares rather favorably with that of the corrected rate for the country at large of 0.59 per cent. If the center's rate were corrected, using the same basis for correction as is used for the United States, the rate for the center would fall to 0.09 per cent, or less than 1 death for every 1,000 live births.

We do not believe that these results are simply fortuitous. They show what can be accomplished working in a poverty stricken environment when the principles of sound obstetrical practice are applied to the care of the maternity case. These principles are enumerated:

1. A trained obstetrician is in complete charge of the work.

2. Adequate prenatal care is available. A field nurse follows up delinquent patients.

3. Constant attendance—A graduate doctor, a medical student, and a nurse are in constant attendance during labor.

4. There is adequate equipment and personnel for both normal and operative deliveries.

5. A simple, intensive aseptic technic is uniformly followed.

6. Isolation—The patient is cared for in a favorable environment for the obstetrical case, *i.e.*, the home. Here she is truly in an isolated unit and she is not exposed to a congregation of infected cases.

7. A minimum of operative interference—Operative intervention is only practised when an indication arises. The operative incidence is low, 6 per cent. There is conservative use of the Caesarian section operation—1:154 deliveries. Vaginal examinations are limited. The progress of labor is followed by rectal examination, and vaginal examinations are only done when a question arises about the diagnosis and then only under aseptic precautions.

8. Good hospitals are available. The efficient coöperation of Chicago's hospitals, especially Chicago Lying-in and Cook County Hospitals has saved many lives. All cases of placenta praevia and abruptio placenta are immediately hospitalized. Prospective donors are taken to the hospital with the patient. No attempt is made to establish a diagnosis on these patients at home. Four patients with ruptured uteri had rapid hysterectomy with 100 per cent good results. There was not a fatality in the 76 Caesarian sections performed entered from the center's service. Many toxemia cases were likewise hospitalized.

9. Hemorrhage control—The doctors are taught to save blood and take alarm early. If anything, blood loss is over-estimated rather than under-estimated. All patients losing over 500 c.c. of blood are immediately seen by the resident physician and all emergency treatment, including blood transfusion, is made available to the patient. No interference is permitted in the third stage of labor unless hemorrhage occurs.

10. Pituitrin taboo—The use of pituitrin is absolutely barred until after the birth of the baby. We consider this rule so important that if a doctor disregards it he is automatically dismissed from the service.

11. There is a sane use of obstetrical analgesia and of anesthesia. All repairs and 85 per cent of the operative deliveries are performed under local methods.

The application of these principles to the care of maternity cases throughout the country would undoubtedly be followed by a marked decrease in the maternal death rate. The question is "Can this be brought about under our present arrangements for the care of the obstetrical case?"

We do not wish to leave the impression that a reversion to home obstetrics is desirable. The well equipped maternity hospital is undoubtedly the ideal place for a woman to have her baby. However, we are not dealing with ideal conditions, and the results of the service of the Chicago Maternity Center show that as good results can be obtained at home as in the maternity hospital at a much lower cost to the community. From a teaching standpoint, a home service is ideal because here the students, doctors, and nurses have an opportunity to observe the patient at her bedside from the time labor starts until the case is terminated. Any home service, of course, must be complemented by a hospital service and the two, working hand in hand, can do much to lower maternal mortality and the cost of obstetrical care.

Public Health Features in Milk Plant Layout*

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AN increasing number of state and municipal laws or regulations require the approval of plans prior to the building of milk treatment plants or the making of additions to existing plants. In most instances the kind of plant desired is not indicated. Thus the health official charged with approval receives plans of all kinds ranging from a few pencil marks on the back of a weigh sheet to the elaborate structural plans of the dairy plant architect. The milk distributor requests instructions relative to the kind of a plan he should submit for approval.

At once it may be concluded that the health official is not primarily interested in structural plans as prepared by the architect or the engineer. Rather, the health official proposes to provide the architect and the engineer with information pertaining to sanitary needs that may be incorporated, and we hope improved upon, in the development of structural plans.

To indicate the sanitary features that should be considered, an attempt is made to present a few of them in the form of health regulations, prepared in accordance with the requirements of the milk sanitation law of Pennsylvania.

GENERAL INSTRUCTIONS

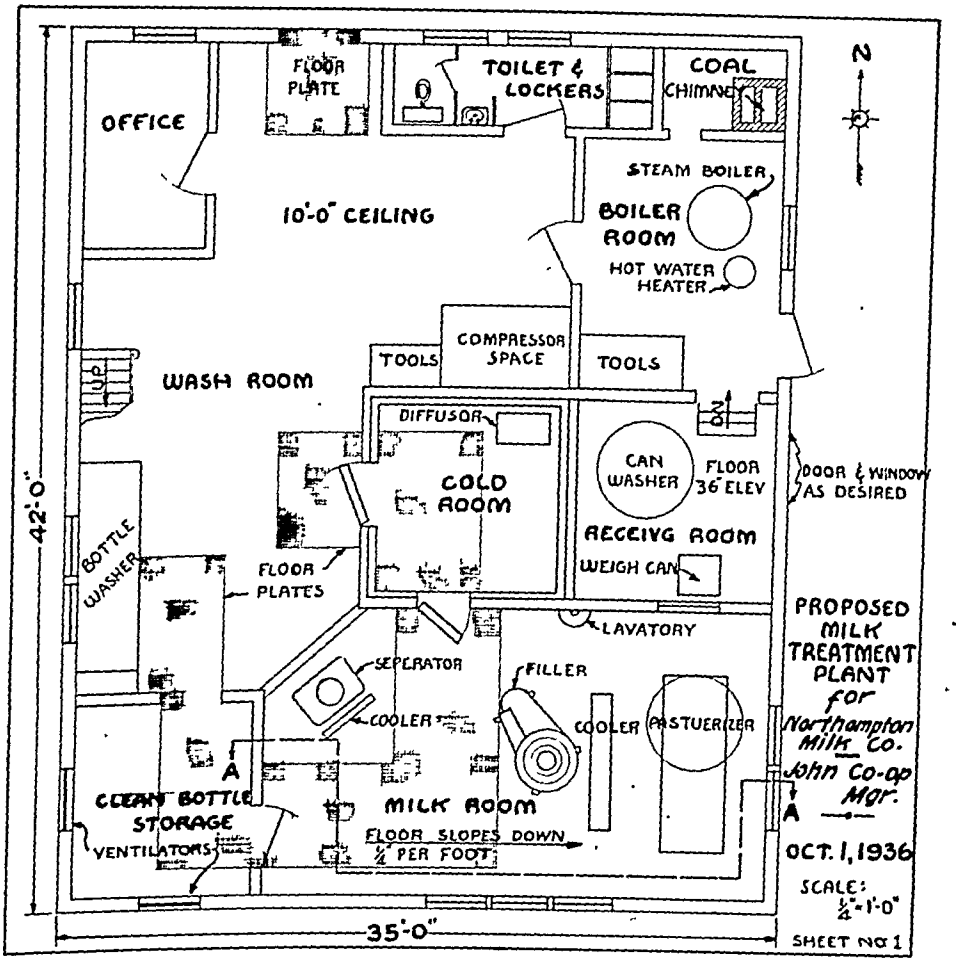
1. Plans shall be approved before construction begins. Plans shall be submitted in duplicate so that an approved copy may be returned to the applicant and an approved copy placed on file in the office of the health official. The plans shall give the name and address of the applicant submitting the plans, the name of the architect or engineer preparing the plans, the date of preparation, north compass point and a number or designation for each sheet.

2. The proper local and state officials should be consulted as to regulations and requirements concerning zoning, building materials, plumbing, power, heat, light, ventilation, fire protection, and all other items involved in new construction or in alterations.

3. Prepare a plot plan using the scale of $1'' = 20'$ or $1'' = 40'$. Cross-section paper may be used. Show the location of all buildings on the plot, entrances to buildings, driveways, surface drainage and sewer connections.

4. Prepare a floor plan using a scale of $\frac{1}{4}'' = 1'$ except for buildings approaching 100', when a scale of $\frac{1}{8}'' = 1'$ may be used. The floor plan shall

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936.



FLOOR PLAN—The plant illustrated is 35' x 42' for handling approximately 1,000 quarts of bottled milk. A one floor plant with a loft for dry storage. Loading in on the second floor to take place through an outside door on second floor. Plant service via inside stairway. The receiving room is not connected with milk room by a passageway. A stationary window in the partition. The use of case trucks in a wash room, milk room, and cold room makes floor plates advisable.

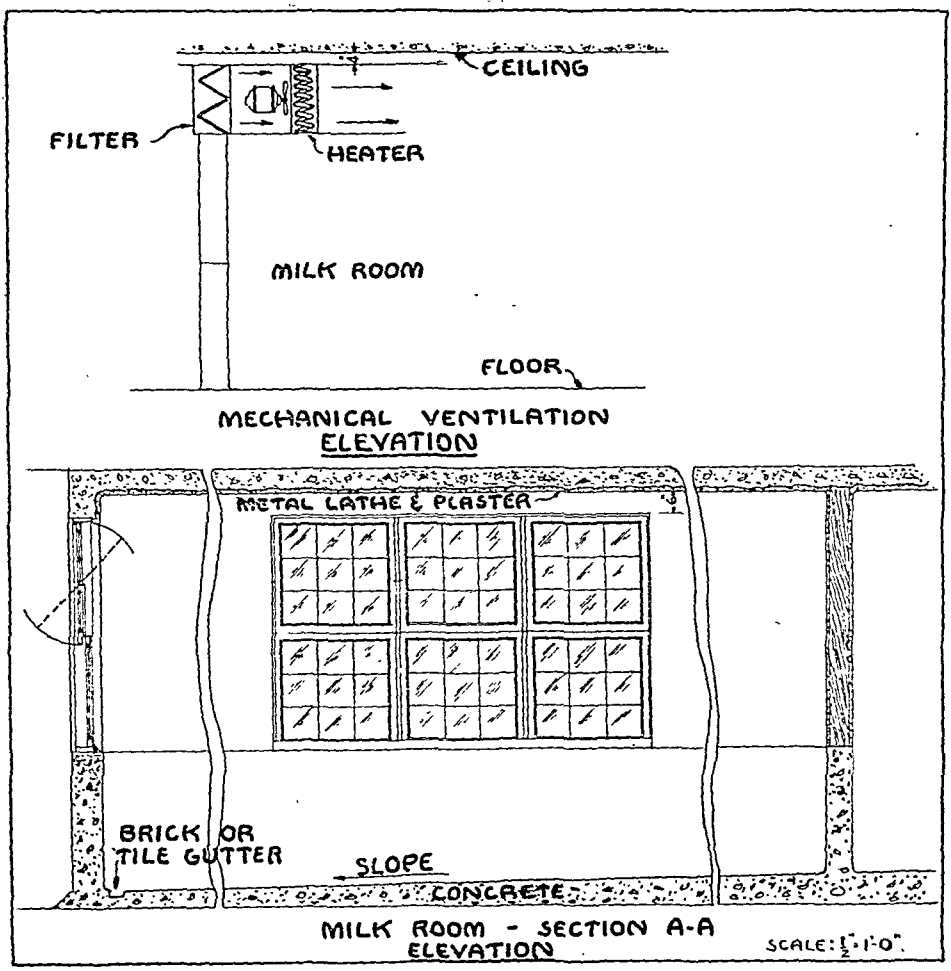
An addition to the clean bottle storage room and the milk room may be used for by-products or for ice cream.

show the location of partitions, doors, windows, ventilators, skylights, drains, and plant equipment. Also give an elevation sketch including floor elevations above and below finished grade.

5. If any part of the building used as a milk plant is used for domestic purposes, that part of the building used for domestic purposes shall not have a passageway that connects with the milk plant.

CONSTRUCTION OF ROOMS AND LOCATION OF EQUIPMENT

1. Rooms in which milk and milk products are handled and containers are prepared, shall have floors of suitable tile, brick, concrete, or other waterproof material. Floor brick or iron floor plates should be considered for those parts of the floor subject to excessive wear by trucks or the rolling of cans. A rounded or coved joint



SECTION "A-A" AND MECHANICAL VENTILATOR—Section "A-A" shows a triple window that may be used for moving equipment in and out of the milk room. The partition is composed of a concrete wall 3' high and a top structure of metal lath and cement plaster on a wooden frame. Fire-proof construction is advisable.

The pivoted window is difficult to screen. When the top section is turned in, the flies on the outside of the building naturally move upward along the screen to the pivot where there is usually sufficient space between the screen and the pivot for the flies to enter the milk room. A bottom-hinged window opening in may be screened on the outside. This prevents the entrance of flies and directs the incoming air toward the ceiling.

An open gutter along one side of the room is useful when the flow may be directed away from the usual working position of the employees.

Artificial ventilation of the milk room consists of bringing air through a filter into the room, and, during cold weather, driving the fresh air through a heater.

where the floor and wall meet is desirable. Walls, to approximately 3' above floor level, shall be constructed of tile, brick, cement, or equally satisfactory material. Walls above this point and ceilings shall be of material having a surface impervious to moisture. A moisture proof joint is necessary. Metal doors and door frames are recommended. Door frames of wood shall end at least 6" above the floor.

2. Finished floors shall slope to

drains. Floor drains should be trapped, sufficient to carry the maximum flow, and located where the largest flow occurs. The drainage system should conform to the plumbing code of the municipality where milk or milk products are to be sold. Pits below floor level should be avoided.

3. Light and ventilation are important. Artificial light may be sufficient. Ventilation by opening windows and doors is usually unsatisfactory. Windows used for ventilating should extend to the ceiling. Windows used to ventilate protected rooms shall be screened. Artificial ventilation and air conditioning should be considered.

4. To determine the location of equipment and the floor space required, heavy paper "cut-outs" of equipment to the scale of the floor plan are useful. Locate each piece of equipment on the floor plan and indicate its use as "bottle washer," "filler," etc. Means should be provided for bringing equipment in and out. For this purpose double or triple windows with removable frames or a panel have proved sufficient. An I-beam equipped with a traveler should be considered.

5. Generally, equipment should not be less than 2′ from the wall, 2′ apart, 2′ from the ceiling, and passageways 3′ in width.

LOCATION OF OPERATIONS AND ROOMS

The operations to be carried on in each room shall be indicated on the plan by name as "receiving room," "milk room," etc. Milk and milk products during and after pasteurization, and cleansed containers, utensils, and equipment shall be fully protected. Therefore, rooms for these purposes should receive special consideration.

Milk plants built for receiving milk delivered direct from dairy farms or for receiving milk for pasteurization from other milk plants may have the operations located in rooms as follows:

1. Milk receiving and can washing (receiving room)—This includes weighing equipment, can washer, and sampling equipment. The milk shall flow to a storage vat, pump vat, cooler, or pasteurizer. There shall not be a passageway to the milk room, or by-products room. In some municipalities a separate room is required for the can washer. Rapid removal of steam is necessary in the room containing the can washer.

2. Milk separation, pasteurization, cooling, bottling, and canning (milk room)—These operations must be protected from flies. A darkened passageway, cold room, counter air current, or conveyor is suggested. Hand washing facilities are required in this room.

3. Preparation of by-products such as butter, cottage cheese and condensed milk (by-products room)—These operations may be carried on in a room opening into the milk room. Hand washing facilities are required in this room.

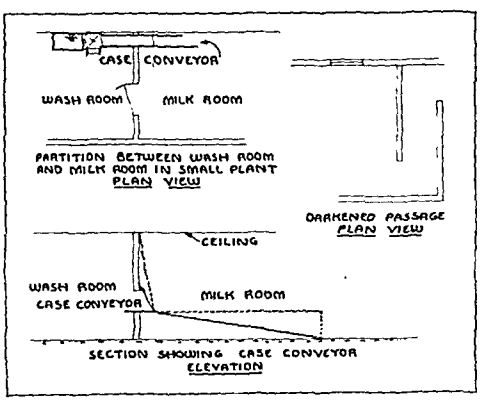
4. Preparation of ice cream and other frozen milk products (ice cream room)—These operations may be carried on in a room opening into the milk room. Hand washing facilities are required in this room.

5. Storage for clean bottles and cans (clean container room)—This may be a darkened, well ventilated room connecting the wash room with the milk room, by-products room or ice cream room. If other means for protecting these rooms are provided a clean container room is unnecessary, and the clean containers may be placed in the room where they are to be used.

6. Cold storage (cold room)—Pasteurized milk, by-products and ice cream may be prepared in rooms connected by passageways. Thus, pasteurized milk, by-products, and ice

cream may enter the cold room through a door from each room or through a door from one of these rooms. Loading out from the cold room shall not be through rooms in which pasteurized milk, by-products and ice cream are prepared. The hardening room for ice cream may occupy a part of the cold room.

7. Washing of bottles, plant cans, ice cream cans, utensils, and equipment (wash room)—The rapid removal of steam from this room is necessary.



BOTTLE CASE CONVEYOR AND DARKENED PASSAGE—For fly protection we have suggested a darkened passageway, cold room, counter air current, or conveyor. A conveyor may consist of an in-the-case bottle washer connecting the wash room with the milk room or a bottle conveyor and a case conveyor connecting a soaker type bottle washer with the milk room. The illustration given is of a small milk plant using a bottle washer consisting of a vat, motor driven brush, and a manifold used for rinsing and sterilizing. The sterilizer is connected with a case conveyor that passes through the partition between the wash room and the milk room. There are several designs of conveyors.

An 18" or 20" self-closing door is shown for the passage of employees. The section of the conveyor indicates a one-way door. Therefore the cold room of this plant should have a loading out door that will not interfere with the protection of the milk room. If the conveyor is for taking empty cases into the milk room and bringing filled cases out of the milk-room, the conveyor door must be free swinging. Conveyors 15' or 20' in length may be of angle iron, otherwise roller conveyors are advisable.

There is no objection to locating the steam boiler, hot water tank, and compressor in this room. However, except in very small plants, the applicant should consider a boiler room in which to locate the steam boiler and hot water tank, and a compressor room for the refrigerating machinery. Space is necessary for the storage of bottle cases, unwashed bottles, cans, etc. Cleansed containers shall pass from the wash room to the milk room, by-products room and ice cream room through a clean container room, a darkened passageway, a bottle washer, or other passageway that prevents the entrance of flies and may be kept in a sanitary condition.

8. Steam boiler and hot water heater (boiler room)—A door from this room shall open to the outside of the building. This room may be combined with the wash room. The refrigerating machinery may be in a separate room. This is recommended by the manufacturer. The compressor room should have a door or a window to the outside of the building. This room may be combined with the wash room or the boiler room.

9. Lockers for clothing, washing facilities, and toilet facilities for employees (toilet and locker room)—This room shall not connect directly with the milk room, by-products room or ice cream room.

10. The office, laboratory, dry storage room, garage, laundry, etc., may be located as appears convenient provided they do not interfere with the protection required for the milk room, by-products room, ice cream room and clean container room. All means necessary shall be taken to prevent flies entering the milk room, by-products room, ice cream room and clean container room. These rooms shall not have a passageway direct to the outside of the building. Equipment and

utensils belonging to these rooms shall be cleaned in these rooms so far as practicable.

Milk plants for the preparation of milk for pasteurization and usually termed "milk receiving plants," are plants for the weighing, sampling, cooling and preparation of milk and cream for delivery to another plant. The operations carried on in these plants do not prepare milk or milk products for sale to the consumer. Therefore, the operations and rooms are reduced in number. However, the milk leaving the weighing equipment in the receiving room shall be protected from flies and dust. Cleansed containers and equipment shall receive like protection.

SUMMARY

The regulations presented are for the purpose of obtaining:

1. Compliance with Pennsylvania law. The divisions in the plant may differ from those required in some other places.
2. A milk room protected from flies and located so that it cannot be used as a passageway.
3. Equipment located so that every part is accessible for cleaning.
4. The processing of milk and the cleansing and filling of containers carried on in progressive steps. No "back tracking."
5. A steam tight surface for walls and ceilings and ventilation to prevent condensation on walls and ceilings.
6. Sanitary features that make it easy to handle milk and cleansed containers in a clean manner.

"Pasteurized" Custard-filled Pastries

FOLLOWING the publication of an article in *Food Research,* a series of experiments on the rebaking of custard-filled éclairs, cream puffs and doughnuts was conducted by the Bureau of Food Control of the City Health Department (Baltimore) with the assistance of the Bureau of Laboratories. The rebaking process is entirely practical from the point of view of both baker and bacteriologist. The procedure, analogous to the pasteurization of milk, is briefly as follows:

After the pastry has been made and filled with custard it is subjected to a rebaking process at a temperature of 425° F. for 20 minutes. Any infectious organism in the custard is destroyed by this process which makes the risk of food poisoning practically nil. The pastry can be given this additional heating without materially affecting its taste, texture, or appearance. If it is a chocolate-covered product, like an éclair, the outer chocolate covering is added subsequent to the rebaking process.

The City Health Department experiments would seem to confirm the findings published in *Food Research* and it is hoped that they will make possible the elimination of a serious public health problem. — *Baltimore Health News,* Oct., 1936, p. 65.

Recent Trends in Public Health Engineering Practice*

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SOMEWHAT over 10 years ago the writer stated before an Annual Meeting of this Association that

" Experience and experiment will demonstrate in increasing measure the advantage of providing for man from birth to old age a healthy dwelling, in a carefully planned city with protected food supplies, safe working conditions, and protection against insects, rodents, and bacteria and their ravages."

He pointed out at the same time " the wonderful prospect for the application of intelligent research, careful practice, and interesting accomplishments awaiting the sanitary engineer in the fields of malaria control, housing design, city planning, industrial hygiene and sanitation, food handling, etc., in the adjustment of the environment to the maximum advantage of the individual."

The prediction, of course, was not an original one and no time limit was placed on the accomplishment of the tasks set forth. It is true today as it was then that civilization rests upon a " thin crust of environmental protection," although its thickness may have been increased somewhat through the efforts of the engineer engaged in environmental sanitation. When Hippocrates, some 2,400 years ago, called attention to some of these environmental effects on man in his treatise " On Airs, Waters and Places," he attempted an evaluation of trends in public health engineering practice. The risk is great in not only setting forth recent activities, but in relating them to the general advance in public health control, because only time may properly indicate the significance of our present efforts.

Some of us no longer have the courage of the late Sir Joseph Chamberlain, once Mayor of Birmingham, England, when he entered the mayoralty and announced " In twelve months, by God's help, the town of Birmingham shall not know itself." We are constrained to indicate only symptomatic changes in engineering practice as applied to public health and to avoid " time claims."

GENERAL SYMPTOMS

If one characteristic of the recent trends in engineering may be detected it is that the attitude and the field of practice has expanded from the particular to the general. Not only have the number of activities of engineers in public health increased, but their impact has been extended to the entire social structure. Where individual water supply control was generally the

* Read at a Special Session of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 20, 1936.

area of action 10 years ago, today the engineer must visualize the problem as regional and even nation-wide. An amebic dysentery epidemic in Chicago affects the population of 50 or 60 other cities. The operations of the WPA in the Middle West re-creates a problem of malaria which has been presumably extinct in that area for over half a century. The tunnel workers in the south find kinship with the marble workers in Vermont in the nature of the industrial hazards which their activities create in both areas.

What the public health engineer does is increasingly correlated with the activities of the physician, the laboratory worker, the industrialist, and the agriculturist. The field of action of the engineer has truly become the land, the water, and the air. Not only the physician, but the engineer must become increasingly alert to the significance of Dr. Winslow's recent reiteration that "Health should mean something more than just staying alive." Again, some 10 years ago, the present writer charged that "Little or nothing has so far been contributed to the positive phase of environmental control." Rapid strides have been made since that time, but much remains to be done to meet the ideal of satisfactory control of man's surroundings for his greatest comfort and health.

To continue this task along the most satisfactory path the engineer must depart to a greater and greater degree from measuring his accomplishments in the public health field by death rates alone. Accomplishment in the field of environmental control cannot be successfully evaluated by current sanitary indices of death. A search must be made promptly for some index of comfort and positive health which will permit the engineer to extend and to justify the specific activities in which he is now engaged or which he may be tempted to encompass in the near future.

One of the misfortunes in the delay in providing adequate housing for millions of people in the United States lies in the fact that we have been unsuccessful in quantitatively evaluating the effects of bad housing on the mental and physical characteristics of the population. In the same way in the field of recreation, in the control of noise, in the development of open areas in congested cities, delay has been controlling, since not yet have the intangible effects of these social assets been made susceptible to statistical measures. Fortunately in these fields, engineers have proceeded on the historically valid assumption that sometimes the instincts of man in his desire for these advantages are better guides to social action than are the failures of medical and statistical diagnoses to disclose their mathematical merit.

In the absence of such indices it is impossible of course to point out what quantitative effect engineering practice has generally had on the public health of our people. It is impossible to check the relative importance of many of the activities listed herein on the hundred million or more cases of illness in the United States in an average year. When the American Public Health Association recognizes what the Health Section of the League of Nations has already recognized, namely, that public health activity requires an additional group of new indices for housing, nutrition, physical education, etc., the practices in engineering herein discussed may gain new force and perhaps even new budgets.

The Social Security Act has perhaps done more to stimulate sanitary engineering activities in the field of public health than any recent event. The emphasis, in its administration, on improved training, expansion of scope, and

increase in numbers of engineers, has made possible a renaissance and extension in the field of environmental control, which has done much to correct the deficiencies and almost complete extinction of these activities during the depression years. This is perhaps a fitting occasion to recognize the debt which sanitary engineering owes to the wise and courageous administration of the public health features of the Social Security Act.

SPECIFIC SYMPTOMS

Perhaps the oldest field of action of the engineer has been in the control of water and sewage. Technical advances in this field have been largely those of refinements of process, of raising the standards of quality, and of performance. From the standpoint of quantitative change, progress, perhaps largely through the grant-in-aid stimulation of the federal government, has been greater from 1933 to date than in the previous quarter of a century. It should be of more than ordinary significance to this Association that of the total number of sewage treatment plants in the United States, 25 per cent have been completed in the last 3 years.

It has been over half a century since the Massachusetts Drainage Commission, in its classical report to the legislature, likened conditions in certain Massachusetts streams to those in England, where because of the " filthy and disgusting " conditions, " large sums of money had to be expended in haste to mitigate the extremity of the offense." The charge, of course, was equally true of the entire eastern United States, and became increasingly true of the major middle western streams.

Perhaps the outstanding accomplishments of engineers in recent years are in the field of extension of sewerage and sewage treatment facilities. In this field again may we not properly raise the question as to whether some more helpful index to the sanitary conscience of our people is not necessary as a substitute for, and an extension of, the typhoid fever death rate. With the experience of many West Virginia and Ohio cities during the drought periods of 1930 to 1933 in mind, it may well be queried whether an index of decency in streams is not a better public health signal of danger than a typhoid fever death rate.

The emphasis placed by the Mississippi Valley Committee and the various water resources committees of the National Resources Committee, on the multiple use aspect of streams, has extended the horizon of engineers beyond the limited functions with which they had previously dealt. The work of the sanitary engineer in the field of water supply and sewage disposal is becoming increasingly integrated with that of power, navigation, flood control, irrigation, and collateral uses. The integration complicates the sphere of action, but it should result in a greater emphasis upon social objectives and less upon special endeavors.

In food control, the increasing emphasis on technical supervision of milk sanitation should be pointed out, particularly in the design, construction, and operation of pasteurization plants and equipment. The Committee on Milk, of the Conference of State and Provincial Health Authorities, stated in its 1936 report that " the design and operation of pasteurization plants have in the past 10 years rapidly assumed a character which requires a degree of expert engineering supervision which is not available to most local health departments, and which should, therefore, be provided by the sanitary engineering divisions of the state boards of health." The committee recommended, therefore, that at least one

sanitary engineer be employed in every state department of health for the purpose of supervising such plants. It urged likewise that all plans for the construction or reconstruction of pasteurization plants be approved by state health departments.

This extension of activity in the control of food should have been an obvious one, but it too was delayed until the technology of food control became so obviously engineering in character that this activity in specialized form became a health department necessity.

Similar experience has characterized that most important trend in industrial hygiene and sanitation. The growth of industrial hygiene units in state and city health departments has been almost phenomenal. Prior to 1936 only 4 state health departments conducted work in industrial hygiene and even in those the work was of limited nature. This situation is all the more striking when one considers the significance of only one of the major diseases resulting from industrial processes, namely silicosis.

Through the aid to states by the provisions of the Social Security Act, industrial hygiene units have been established in at least 12 more state health departments. In these units the engineer is necessarily playing an important rôle. In many instances, in fact, the only industrial hygiene work is carried out in the sanitary engineering bureau. In addition, much of the evaluation of the causes of certain occupational diseases and the conditions surrounding them has been placed on a sound foundation through the engineering studies of only the past 10 years. In this field, opportunities for profound control by engineering technics are unlimited.

How inadequate our control of the atmosphere remains is strikingly emphasized by the experience in a part of Belgium along the Meuse Valley, December 1 to 5, 1930. During that time a thick fog covered the area. A large number of people were injured; several hundred were severely attacked with respiratory troubles, and 63 died after only a few hours of sickness. Many cattle had to be slaughtered. When the fog disappeared on December 6, the respiratory trouble rapidly ceased. Public opinion was aroused not only in Belgium, but also in adjacent countries. London administrators calculated that, if such a phenomenon occurred there, they would be faced with the responsibility of 3,200 sudden deaths.

The occurrence was made the subject of a special investigation, but identification of the causes still remains unsatisfactory, although sulphur dioxide was generally assumed to be at least one of the primary causes.

That incident is recalled here only to demonstrate the social and hygienic importance of questions connected with atmospheric pollution. More important even than the Belgium catastrophe is the fact that so little is known about or done to correct the objectionable features of atmospheric pollution. It is disconcerting to note that a recent review of over 20 years of experience in a number of English cities with atmospheric pollution control, discloses only limited improvement in some, deterioration in others, and stationary air pollution conditions in still others.

In the United States, progress is even less rapid, and current measurements of air condition and pollution leave much to be desired. If we may detect any trend in this particular field, it is in the wrong direction. It may serve a useful purpose to point out that both interests and activity in the field of atmospheric pollution control are at a lower ebb today than 10 years ago.

A revival of interest from the engineering standpoint again awaits a more sensitive index to the benefits to be derived from this type of activity.

Similar comment may be made with reference to the fluctuating interest and activity in the control of noises and of odors. The physiological aspects of both of these sets of phenomena need greater study and interpretation. When their significance has been adequately developed, technical progress in control will follow. Both fields have the fancy of the public, but neither has so far had the advantage of complete understanding of physiological effect. Public health workers have therefore viewed their control with suspicion.

Mosquito control, particularly for malaria restriction, has been gradually shifting from temporary expedients such as larvicide application and home screening campaigns, to drainage as the more permanent device. Antimalaria drainage in turn is extending its area of operation from urban centers to suburban and even rural areas. This progress has resulted in noticeable increases in the installation of permanent ditch linings. In antimalaria research, studies of cheaper materials for ditch lining and of simple machinery for ditch digging and lining have predominated. Of greater importance, however, has been the initiation of studies of biological control to develop new means of malaria control with less disturbance of natural or artificial waters. The creation of large impounding reservoirs for multi-purpose use throughout the United States has complicated the problems associated with such bodies of water. Fluctuating levels of water, hitherto desirable for mosquito control, are being found unsatisfactory for other life. The reconciliation of conflicting purposes is one of the problems of impounded waters.

As already pointed out, a trend in public health engineering with particular reference to housing, is not only not detectable, but operations in this field have virtually elicited no public health engineering interest. The creation of the Committee on Hygiene of Housing by the Committee on Research and Standards of this Association is perhaps the most significant step in this direction which the Association has taken in the past 25 years. It is the first recognition which the Association gives to the importance of one of the major environmental aspects of human existence.

When Chamberlain commented on the center of his city and the shambles of houses and dwellings that surrounded the town hall to the effect "They are unfit for a dog to die in," he described with considerable accuracy the territory surrounding almost any town hall in almost any major city of the United States in 1936. It is regrettable to report in this paper that at the present writing the engineer, and the health department in its entirety, has so far passed by this problem in most instances stone blind. The cause of the failure of action may again be attributed to the absence of a vital statistics index to the relation of good housing to improved vitality.

In this field, the writer merely raises an issue rather than reports a trend. If we remember, however, that the United States today needs 10 million new homes to provide decent living conditions for virtually one-third of our population, is this not an area for engineering endeavor in which initiation of activity prior to identification of public health effect may be warranted?

It is not a coincidence that many times in history professional workers have been wrong about the significance of some activities in their particular field. What has just been said in reference to housing is historically more

striking in regard to the control of plumbing. Engineers have developed a highly complex and satisfactory technic of the control of treatment of water supply, from source to property line. For many years many of us have felt that the same degree of control should be exercised, from the public health standpoint, from the property line directly to the consumer. One of the most unfortunate decisions made in public health practice was that of some years ago to transfer the control and inspection of plumbing from the health department to the building department.

The experience with amebic dysentery in Chicago and with literally hundreds of other unfortunate cross-connection situations in internal plumbing throughout the United States and abroad, should cause officials promptly to retrace their steps.

Recently a sample of blood was submitted by a Baltimore hospital to the Bureau of Laboratories of the Baltimore City Health Department for quantitative determination of lead. Another sample for the same analysis was submitted 10 days later by another hospital in the city. The laboratory reports in both instances gave evidence of lead poisoning. This finding was confirmed by the hospital records which showed histories of severe abdominal pains, lead line in the gums, and stippling of the red blood cells. Both patients were employed in the same industrial plant where large quantities of a lead compound are handled.

As a result of further study it was learned that several months previously workers on a night shift had noticed and reported a milky appearance in the water supply at the drinking fountain. Apparently some of the employees drank this water before the condition was discovered. A warning was then sent to all the employees not to drink the water, and changes in the piping arrangements were made immediately. Representatives of the Bureau of Environmental Hygiene of the City Health Department visited the plant and found that there had been a contamination of the water supply. This had resulted from a cross-connection in the piping system which had allowed the lead compound used in the manufacturing process to be pumped into the drinking water supply, due to low water pressure.

This incident merely reëmphasizes the ever increasing group of unusual types of health hazards which may result from plumbing cross-connections. The literature of the last 5 years uncovers hundreds of these, and a careful survey of the United States would undoubtedly disclose thousands of opportunities for contaminating the water supplies of every community in the United States. Plumbing control is obtaining the increasing scrutiny of engineers. It should receive the increasing understanding of medical officers of health.

SUMMARY

Engineering practice in the field of control of the environment of man for the protection of his health and comfort discloses intensification and refinement of operating technics in water and sewage treatment; increased specialization in the control of food products; analysis, regulation and correction in the field of industrial sanitation, and the development of new technics in the control of mosquito-borne disease. Much more remains to be done in the control of air pollution, stream pollution, housing, plumbing, noise, and odors. In these latter fields scientific data, criteria of physiological effect, standards of practice, and medical recognition of public health significance are still missing links.

In the field of engineering, as in the

general public health field, operations appear to be moving toward the inclusion of all of those undertakings which consider " public health " as a major social objective, and as not merely sewage disposal, or the prevention of infectious diseases, or popular instruction in " hygiene " (Sydenstricker).

Disposal of Oil Field Brines in the Arkansas River Drainage Area in Western Kansas

THIS report presents the results of of a study of the oil producing fields within the Arkansas River drainage area west of Hutchinson, Kans., with reference to the disposal of oil-field brines. Available information has been gathered on the present methods of disposal, their advantages and disadvantages. Details on the difficulties encountered in disposing of brines in subsurface formations are included. A number of corrosion tests on subsurface disposal systems also have been included, which will be used as a basis for continued study. A summary of the findings in this study is as follows:

1. In general, most of the fields in the area covered by this report, now have few producing wells, and therefore are relatively small brine producers. As the fields increase in size and age salt-water production increases; thus increasing the seriousness of the problem of disposal.

2. The general practice of impounding brines in ponds is not an effective method of disposal in this area because of the character of the surface soil and the nearness to the surface of the domestic water supply.

3. Stream surveys indicate that the high mineral content of the Arkansas River and its tributaries is due more to drainage from salt marshes and industrial wastes than from producing oil fields. Some brine from the producing fields reaches the Arkansas River and at times " slugs " of brine are carried down when ponds are dumped, but this increase accounts for only a small percentage of the mineral content of the Arkansas River.

4. Subsurface disposal of brine, when no attempt is made to condition the brine, often results in a deposit composed principally of corrosion products, carbonates, and sulphates being carried into the disposal well. A system under which these factors are kept at a minimum will result in extending the life of the disposal well. Studies of the conditioning of brine should be encouraged as it is under exceptional conditions only that unconditioned brine can be injected into subsurface formations without clogging by materials held in suspension.

5. The design of the disposal system will have a great influence on the amount of corrosion that takes place when the materials used in the system are corroded by hydrogen sulphide, oxygen, and brine. Preliminary corrosion tests indicate an increased rate of corrosion when brine with a high hydrogen-sulphide content is exposed to the atmosphere, but a reduced rate when the hydrogen-sulphide content is lowered materially by considerable aeration. The corrosion rate remains constant in a system in which brine with a high hydrogen-sulphide content is virtually unexposed to the atmosphere.—

Department of Interior Report of Investigation 3318, Oct., 1936.

Recent Advances in Laboratory Methods*

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LOOKING back through the centuries at the development of medical practice is like viewing the mountains in the distance. The peaks stand out. The peaks in this instance represent epochs of great medical progress and are signalized either by one man or a group. Morgagni represents one of these epochs. The publication of his papers in 1761, in which he correlated the clinical manifestation of disease in the patient with observations made at the post-mortem table, gave clinicians a method of study for the elucidation of symptomatology and other characteristics of late disease. This method has not been changed very greatly. The medical student still obtains his understanding of disease by following the patient to the morgue, and the medical teachers and textbooks describe the pathology of disease from what has been found at post-mortem examination.

Since Morgagni other peaks have been raised: by Pasteur, the founder of bacteriology; by Koch, who established the science of infectious disease; by Roux and von Behring, immunologists; and by Robert Boyle, the chemist: Claude Bernard, the physiologist; and von Helmholtz, the physicist. Out of these epoch-making contributions new methods of study have been introduced and new information upon which to base new methods of clinical practice have been obtained. The biology of incipient disease has become a concept the practice of which changes the emphasis from the late manifestation of disease to the early, from the post-mortem table to laboratories of experimental biology—the physiological laboratory, laboratories of bacteriology, immunology and physiological chemistry. It has made possible early diagnosis by functional studies which detect disease before gross morphological change has taken place.

Viewing medical history in the making is like viewing the mountains at close range. The peaks are not seen, the small irregularities, the deep and ugly gashes and other minutiae obscure the view. To pick out of recent medical literature those contributions which will be most important in the determination of our understanding of disease and in shaping methods of practice is almost an impossible task. If, however, we withdraw to a short distance it is possible to see certain high points taking form, and certain trends developing, and also it is possible to see some of the changes which have been brought about in practice.

This Association is itself one of the results of the development of a new science, the science of disease control and prevention, sanitary science and preventive medicine. It has grown out of the contribution of many great scientists and in the years to come those who look back over medical his-

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tory will see the new peaks, sanitary science and preventive medicine, towering majestically among the peaks of medical history. The individual lines, seams, and irregularities of these mountain peaks will be obscured and it is probable that as Morgagni signalized an earlier epoch, Pasteur will signalize the introduction of sanitation; but who will represent preventive medicine, as the biology of incipient disease, does not seem clear at present, unless it be Ehrlich.

The American Public Health Association is interested in the prevention and control of disease and the membership is composed largely of people whose time is occupied with duties which have to do with the application of those special sciences which are useful in the solution of medical problems of public concern. It seems proper, therefore, that a review of recent contributions to laboratory methods should dwell particularly upon those advances which have reached that point of organization where they are actually influencing methods of practice for disease control or are beginning to influence concepts as to what public health means in terms of practice.

Sanitation, as distinguished from preventive medicine, has been the chief concern of this Association since its founding; and its members have been largely instrumental in the effective control of such diseases as typhoid fever, bacillary dysentery, and other enteric infections and infestations. This control has come through the purification of municipal water supplies, the disposal of sewage, and other domestic sanitary measures. It was made possible through the development of bacteriology. Laboratory methods have supplied the fundamental biological information upon which interpretations are made and the technic incident to the determination of the sanitary quality of water, and in turn the effectiveness of methods of purification. Therefore the publication last year of a new, 8th, edition of *Standard Methods of Water Analysis* marks another advance in sanitary science. In this field the distribution of pure milk also offers a problem. Year before last a new edition of *Standard Methods of Milk Analysis* was published. This edition incorporated a new section on the examination of ice cream. The frequent revision of such books marks important advances in the organization of scientific knowledge and affords all laboratory workers an opportunity to change their methods with advances in science and provides administrators an opportunity to exercise a better scientific control over the quality of these food supplies. A discussion of the changes in methods described in these books is not within the scope of this paper but it should be remarked that changes suggested in the types of culture media, and incubator temperatures used for determining the number of bacteria in milk, and the selection of certain kinds of bacteria which have special significance in milk and water sanitation may in the near future make radical changes in the technics used in control laboratories and will markedly influence the significance of these examinations.

While sanitation has advanced most rapidly since the advent of bacteriology, preventive medicine until just recently has lagged. General measures, such as quarantine and specific prophylactic immunization in a few instances, have been about the extent of the activity. Recently, because of a growing knowledge of the biology of infectious diseases, the importance and possibility of the recognition of incipient disease has taken a prominent place in the activities of health departments; and because of a rapidly growing knowledge of the

biology of bacteria there has been a great improvement in the technic of laboratory tests for the early diagnosis of many of the communicable diseases and methods for the preparation of biological reagents of all kinds. A good deal of this advance has come through a better knowledge of the sensitiveness of bacteria to apparently slight changes in environment. It is known for instance that stock cultures undergo profound changes as to virulence and antigenic composition as a result of slight changes in the media upon which they feed and the temperature at which they are grown. This has proved to be of the utmost importance in the care of stock cultures which are used for the production of antitoxins, toxins, and vaccines, which are to be used for therapeutic and prophylactic purposes.

Selective media for the demonstration of characteristic biological features of certain bacteria has improved the diagnostic facilities of laboratories and created easy and more certain methods for the location of carriers, and the isolation of patients until the period of communicability has passed.

The recognition of new methods of study to determine the qualitative and quantitative relationship of specific antigenic fractions in various bacteria has led to improvement in serological and bacteriological technics which have diagnostic and preventive significance.

Until recently the isolation of *B. typhosus* from the excreta of patients and carriers and convalescents has been an uncertain procedure because of their association in the intestinal tract with the colon bacillus, which is always present in such large numbers. With the introduction of bismuth sulphite brilliant green medium (Wilson and Blair) and other special media these organisms can be isolated without the interference of the colon bacillus and other intestinal bacteria. The use of these media will give more effectiveness to the requirement that convalescent cases be kept in isolation until they are no longer shedding these pathogenic bacteria. Since isolation can often be accomplished by this means before other laboratory tests, such as the agglutination reaction, are positive, it offers a method for the early diagnosis and isolation of cases. The advantages offered in the location and control of carriers are obvious. In this connection Arnold has demonstrated that the isolation of *B. typhosus* from gall bladder bile obtained through a duodenal tube can be more certainly accomplished if the gastric contents are first neutralized with sodium bicarbonate or calcium carbonate. Forsbeck, using this method, has studied gall bladder excision in the treatment of chronic carriers who have been proved to harbor *B. typhosus* in that organ.

The recognition of gonorrhea in chronically infected patients and the determination of the period of communicability has been made more certain by the use of special culture methods. Cases considered to be clinically cured by the physician often are proved by properly made cultures to be still harboring the organisms in secretions from the genital tract. The standardization of this procedure would facilitate its adoption by public health laboratories for general use and would effect a better control of this disease.

In the control of tuberculosis the activity of the laboratory has been confined to the microscopic examination of sputum, and the manufacture of tuberculin. By a better understanding of the food requirements of the tubercle bacillus and by making use of the selective lethal action of certain acids for other bacteria found in sputum, cultures can be made which will reveal them in microscopically negative spu-

tum. Evelyn Holmes has reported that cultures were positive in 50 per cent of the microscopically negative sputa examined by her. Another method of considerable importance in the study of active tuberculosis is the examination of gastric content removed in the morning before breakfast from patients who are raising no sputum and show only minimal lesions in the fluoroscope and in X-ray plates.

Pneumonia as a cause of death ranks high among the communicable diseases. You have already heard of the work which has brought treatment with specific immune serum to almost 60 per cent of the patients who develop the lobar type of this disease. This treatment greatly reduces the death rate among patients who are infected with either type one or two pneumococci. The effectiveness of this treatment depends upon the early recognition of the type of the infecting organisms. Such determinations are made possible by the use of the phenomena described by Neufeld in 1902 and suggested in recent years by Sabin as a rapid direct method for the recognition of the type of pneumococci in sputum from pneumonia patients. Sabin has also described a rapid slide agglutination method for typing pneumococci in sputum. The Neufeld test can be carried out in a few minutes while the Sabin method requires only 4 to 5 hours for completion. The small monograph, "Lobar Pneumonia and Serum Therapy," by Lord and Heffron, based upon the studies made in Massachusetts is an important contribution to this subject.

Studies on the biology of hemolytic streptococci by Anna Williams, Kirkbride and Wheeler, Julia Coffey, the Dicks, Doche and Lancefield, to mention only a few, are bringing us nearer to an understanding of the etiology of scarlet fever, erysipelas, and septic sore throat and to methods of treatment for their control and prevention.

We now come to a field of investigation which has been actively under study for the past several years and which has revealed information of fundamental importance. I refer to the antigenic composition of bacterial cells. The presence of many antigens in a single bacterial cell has been known since the work of Grüber and Durham in 1896. These studies and others within the last two or three years, notably those of Arkwright, Andrews, and Landsteiner, have revealed that two otherwise unrelated organisms may contain varying proportions of similar antigens as well as dissimilar ones, and conversely otherwise identical organisms may contain varying proportions of the same antigen as well as dissimilar ones. This explains much of the confusion surrounding agglutination reactions and has led to an improvement of the technic for carrying out diagnostic tests depending upon this phenomena. Notable have been the reports of Felix and Pitt. They discovered a new and third antigen in the typhoid bacillus. Their studies indicate that this antigen is associated with inagglutinability of certain strains of *B. typhosus* and also determines its virulence. The importance of this subject in the identification of strains of this organism, the production of prophylactic vaccines and the study of serum from suspected cases of typhoid fever is immediately apparent. When we consider further that this antigenic complex varies greatly with the slightest change in the environment in which the cultures develop, the significance becomes broader, and leads to the consideration of bacterial dissociation and its importance in the selection of cultures for the manufacture of biologics of all kinds. Murray and Branham, Kirkbride and Cohen, and Sophie Cohen, to mention only a

few investigators, have demonstrated the importance of the selection of strains of meningococci for serum production and have shown the marked difference in the virulence of strains of this organism. Welch, Mickle and Borman have shown the necessity of careful attention to cultures of Proteus X 19 which are used in the diagnosis of typhus fever. They demonstrated the multiplicity of antigens which may be found in some of the cultures of this organism and its susceptibility to variation. The work of Leslie and Gardner resulted in the demonstration of several phases in the development of cultures of *B. pertussis*. These phases are distinguished by the recognition of differences in antigenic structure. Without carrying this into any technical discussion, it is important here to point out that in one phase, phase I, the antigenic structure is of such a nature as to suggest that in this phase and this phase only is the culture suitable for the preparation of potent prophylactic vaccine.

One cannot pass by in a search for those contributions to medical science which are likely to be viewed in the years to come as epoch-making without mentioning bacteriophage. This was first recognized by Twort and d'Herelle in 1917–18. In the last few years Burnet and McKee, Levine and Frish have reported that certain of the Salmonella phages act in a specific way through specific antigenic fractions in strains of these organisms. Craigie and Brandon have just reported a phage specific for the Vi antigen of *B. typhosus* and described a method for the identification of cultures of this organism which contain this antigenic fraction. If this proves to be the case it offers an easier and simpler test for the identification of *B. typhosus* and the selection of cultures for the preparation of vaccines.

Next in importance to the unearthing of fundamental biological phenomena is the organization of knowledge so gained into a usable form. The American Public Health Association, through its Committee on Research and Standards and its various standard methods committees, has during its whole existence functioned in this capacity in a notable way. Mention has already been made of the recent publication of editions of *Standard Methods for Water Analysis* and *Standard Methods of Milk Analysis*. In 1933 a new committee was organized in the Laboratory Section for the consideration and study of standard reagents and laboratory procedures for the recognition of communicable diseases. It was apparent from the outset that this committee would have to review all methods now in use and describe new ones where new information concerning the biology of bacteria and the biological reaction which takes place between the microörganisms and the host was available. In the last two years the communications from this committee to the Laboratory Section and the Association have contained important manuscripts on a wide range of subjects. These manuscripts have appeared in the Year Book of the Association each year since 1933.

It has not been possible in the time allotted for this paper to mention many important scientific works. The work of present investigators is so naturally the outgrowth of those of previous years that often it is not possible to say what is recent. I have attempted, therefore, to take a lesson from history and apply it to the examination of recent medical literature in order to determine the trend of medical practice and its influence on the prevention and control of disease. It seems clear to me that by a better knowledge of the biology of communicable diseases the early recognition of these diseases is becoming more certain and that prophylactic im-

munization for more of them is getting closer to reality. It also seems to me that this information is rapidly changing the emphasis in medical diagnosis from post-mortem studies to the study of the biology of incipient disease and thereby greatly extending the practice of preventive medicine.

APPEARING IN THE FEBRUARY JOURNAL:

Protective Antibodies in the Blood Serum of Individuals after Immunization with Typhoid Vaccine

By the Laboratory Staff, Army Medical School, Under the Supervision of J. F. Siler, M.D.

The New York State Program for the Control of Pneumococcus Pneumonia

By Edward S. Rogers, M.D.

The Application of Engineering Surveys to the Hatters' Fur Cutting Industry

By J. J. Bloomfield and J. M. Dalla Valle

Results of a Field Study on the Prophylactic Use of the Nasal Spray in Alabama (Poliomyelitis)

By Charles Armstrong, M.D.

Housing as a Public Health Problem*

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THE *Journal of Bacteriology* bears upon the cover of each issue a quotation from Pasteur which reads, "It is characteristic of Science and Progress that they continually open new fields to our vision." It is a new field opening to the vision of the health officer—the field of housing—which I wish to discuss briefly.

From one standpoint, of course, housing is a familiar part of your daily duties. From the earliest days the board of health has dealt with specific nuisances and has stood ready in case of emergency to condemn an entire dwelling as unfit for human habitation. In the past, however, our work in this field has been negative and destructive; in the future it must be positive and constructive. We are not content to close polluted wells and destroy contaminated milk; we consider it our daily duty to see that the community has a safe water supply and an effective system of pasteurization. So we must not be satisfied to condemn insanitary tenements. We must also make it a part of our task to see that insanitary tenements are replaced by decent dwellings.

From this standpoint the subject of housing represents a new field of interest for the American health officer and it is a subject which presents difficulties as well as novelties. The problem of housing reform is unfamiliar, and what you do know about it may lead you to suspect that it is a somewhat thorny subject on which you can very easily prick your official fingers. You would perhaps prefer to let is strictly alone; but if I read the signs aright the issue can scarcely be avoided. No British health officer publishes an annual report without a section on housing in the positive sense, and the same inevitable laws of social progress are pressing on us in this country that have operated there. We shall have to gird up our loins for a new task—one of the most important and most challenging we have yet been called upon to face.

What are the reasons why housing must be accepted as a major public health problem of the future?

There are endless statistics, such as the infant mortality studies of the Children's Bureau and the analyses of district mortality in Cleveland and Detroit [1] which demonstrate the intimate relation between bad housing and high death rates. It is illogical, however, to assume that all of this excess mortality is due to the hazards of housing. People do not live in crowded tenements as a result of choice or of accident. They live in crowded tene-

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ments because they are poor, and they are poor—in many instances—as a result of some inherent physical or mental inadequacy. Hereditary inferiority on the one hand, and a whole complex of unfavorable influences associated with poverty on the other, contribute to these excessive mortality rates.

More significant is the evidence from such studies as those made at Liverpool where populations of comparable economic status—living in a slum area, and in corporation tenements—were contrasted, and where a single group of tenants were compared before and after rehousing. In both instances better housing was associated with materially lowered death rates from infant mortality, tuberculosis, and all causes. Even such studies as these must, however, be interpreted with caution, for at Stockton-on-Tees an opposite result was observed, attributed to the fact that the new houses involved a higher rental and a consequent limitation of food supply which overbalanced any beneficial effects of the improved housing.

Whatever, however, may be the exact quantitative contribution of bad housing conditions to the excessive mortality of our low income groups, there can be no doubt of the fact that deficiency in quantity and quality of domestic water supplies, insanitary toilets and overflowing cesspools, overcrowding, lack of light and air, cold and dampness, absence of screening against flies and mosquitoes, fire and accident hazards, do contribute in a substantial—if immeasurable—degree to increased morbidity and mortality.

We have today, however, passed beyond that phase of public health in which our objectives can be measured solely by the yardstick of mortality statistics. Health means much more than just staying alive. It means that sort of physical and mental fulness of living which William James had in mind when he said, "Simply to live, move and breathe should be a delight." We know that a state of under-nutrition above the level which permits survival may produce stunting of growth and lowering of vitality. We know that an overheated atmosphere decreases efficiency and produces a sense of discomfort. Odors interfere with appetite. Lack of adequate illumination causes psychological depression. Overcrowded conditions of living promote immorality. An unattractive home drives children into the streets and increases juvenile delinquency. It may produce a sense of inferiority which profoundly influences personality. Neither physical nor mental health nor fulness of living is possible where a whole family is crowded into a single room of a city tenement or struggles for survival in an insanitary shack on an Appalachian mountain side. The essentials of sound family life must be of vital concern to the health officer of the future; and the intimate connection between bad housing and juvenile delinquency will interest him as much as the relation between congested tenement living and mortality from tuberculosis.

It is such considerations as these which led England as early as 1870 to initiate proceedings for slum clearance and to begin the provision of low cost housing through philanthropic foundations and limited dividend companies. By the second decade of the present century, both England and Germany had made substantial progress in direct governmental support of housing projects, the only method by which the problem can be seriously attacked. After the War, the grave shortage of housing facilities and the high cost of construction stimulated vastly expanded efforts along this line, particularly in the two countries mentioned, in Holland, and in Austria.

According to statistics recently cited

by Ernst Kahn [2] the number of new dwellings erected in England and Wales between 1920 and 1929 averaged nearly 4 per 1,000 population a year (the equivalent of 500,000 new dwellings a year for the United States). For Holland the corresponding figure was 6; for Belgium and Germany nearly 3; for Denmark and Sweden, 2.

In England, there were constructed between 1918 and 1935 2,500,000 new homes, about half of them with financial assistance from the state.

I had the opportunity last summer of seeing something of the housing work in England and was deeply impressed with the success attained. They have mapped out a systematic program involving the following 5 stages:

1. Construction of cottage estates in the outskirts of the great cities
2. Provision of blocks of apartments in the cities themselves
3. Clearing out of insanitary slums and rehousing of their inhabitants on or near the site
4. A nation-wide survey of overcrowding and the re-housing of those families living under overcrowded conditions
5. Re-development of built-up areas (which means slum clearance at a higher level under a comprehensive scheme of Town Planning)

Dr. W. Allen Daley, Principal Medical Officer of the London County Council, informs me that the first three of these stages have been nearly completed. The survey of overcrowding has been conducted during the past year for the whole of England and the rehousing of overcrowded families is under way.

In all the countries of Western Europe the same sort of systematic progress is being made, although Holland and England are still at the head of the procession. I saw last summer a perfectly conceived and executed Garden City at Suresnes just outside of Paris; and all over Russia I found new blocks of tenements for industrial workers and a beginning of new cottages for the rural population on the more progressive collective farms.

The lack of any consistent program in the United States is in striking contrast to what has been accomplished in Europe. We did a little government housing at munitions centers during the Great War. Governor Alfred E. Smith, the first American in public life to realize the importance of this problem, initiated a modest movement for low-cost housing when he was governor of New York; and California has also taken steps along similar lines. On the whole, however, the United States had no housing program whatever, and had no general consciousness that such a program was necessary until within the past 3 years.

As a result of this strange neglect, the housing of the poor in the United States is today at a lower level than that which obtains in any of the leading countries of Western Europe. We have had the same factors at work to create a housing shortage that have operated there. In 257 cities of the United States new dwelling units erected averaged 400,000 a year between 1925 and 1929. The number fell to 20,848 in 1934, less than the number of homes destroyed by fire every year! *

The picture presented by Edith Elmer Wood in a recent monograph [3] is an appalling one. The U. S. Department of Commerce real property inventory conducted in 64 cities in 1934 showed 2 per cent of the structural units "unfit for use" and 16 per cent in the class needing major structural repairs to make them habitable. Seventeen per cent of the occupied dwelling units were overcrowded, 14 per cent lacked private indoor toilets, 20 per cent had neither bathtubs nor showers, 5 per cent were without any running water, and 8 per

* Government authorities estimate new housing construction for 1936 at 200,000 family units.

cent without modern (electric) lighting. Mrs. Wood summarizes as follows:

> The picture emerging will be of nearly a fifth of our urban population living in dilapidated houses, generally crowded, and typically lacking private indoor toilets and bathtubs. Nearly half of these substandard homes are also without electric lights and about a quarter of them have no running water.

With regard to rural areas we have no such comprehensive picture; but studies made by the Children's Bureau reveal striking facts with regard to certain selected areas. In a Montana county, 79 per cent of the homes consisted of one or two rooms only, and in over half of the families there were 3 or more persons per sleeping room. In Mississippi rural areas 10 per cent of white families and 70 per cent of negro families had 3 or more persons per room (counting all rooms). In a Georgia county 70 per cent of the homes showed 3 or more persons per sleeping room.

Mrs. Wood says:

> It has long been known to students of housing that the dwellings and neighborhoods in which a substantial fraction of the American people live are of a character to injure the health, endanger the safety and morals and interfere with the normal family life of their inhabitants.

Catherine Bauer of the Labor Housing Conference and Coleman Woodbury of the National Association of Housing Officials estimate that the construction of over 13 million dwellings is needed to bring our housing up to reasonable standards by 1945—including nearly 7 million to catch up with merely quantitative needs, 3 million to replace dwelling units already unfit for habitation in 1930, and 3 million more to replace units becoming obsolescent between 1930 and 1945. Between 1930 and 1935, the actual net increase of dwelling units was at the rate of only 60,000 a year.

The reason we have so far failed to meet this situation is that—obsessed by the romantic dreams of rugged individualism—we have held to the view that the housing problem could be solved by private commercial enterprise. The brute fact is that in the United States, as in all the countries of Western Europe, there is a considerable section of the population which has an income too low to permit them to pay for housing of a minimum standard of health and decency. This is the very unpleasant conclusion we must face and, once we face it, there are only three alternative solutions of the problem. Either the lower economic group of our fellow citizens must continue to be housed like cattle (far worse than the cattle on a model dairy farm); or the economic structure of society must be changed to provide a living wage for all; or the government must subsidize housing for the lower income group.

In England authorities estimate that 10 per cent of the population have an income too low to permit the payment of an economic rent, and American experts have placed the figure for this country at 30 per cent. Higher interest charges and larger allowances for depreciation, repairs and losses on vacancies and arrears, as well as absurdly inflated speculative real estate values, do make the problem more difficult here; and our American figure can certainly not be lower than 20 per cent of the total population. The Brookings Institute study, *America's Capacity to Consume*, by Leven, Moulton, and Warburton, estimated that in 1929—at the peak of prosperity—over 2 million families (nearly 8 per cent of the total) had annual incomes of under $500; nearly 4 million families (nearly 14 per cent of the total) had incomes between $500 and $1,000; and nearly 6 million families (21 per cent of the

total) had incomes between $1,000 and $1,500. If we allow 25 per cent of the annual family income as available for rent, the first group can pay for rent less than $125 a year, the second group between $125 and $250, the third group, between $250 and $375.

A. R. Clas, then Director of the Housing Division of the Public Works Administration, stated last spring:

> Assuming ideal conditions in outlying areas, a sound house costing $3,500 placed on a minimal $1,000 lot, with an allowance of $40 per room per year for charges other than financing will necessitate an annual expenditure of $500 for rent. A family economically eligible for this dwelling must earn between $1,500 and $2,000 a year.

If we assume that the families with incomes between $1,000 and $1,500 might conceivably be housed under a limited-dividend plan, which is a very optimistic assumption, it is abundantly clear that the families below this level cannot pay even 6 per cent on the capital investment involved. If minimum standards of health and decency are to be secured, 4 million families must be housed by government aid with an interest return of 3 or 4 per cent, and 2 million more families must be provided for with practically no return at all.

There is but one possible answer, as pointed out by the National Association of Housing Officials in the report, *A Housing Program for the United States*, adopted at its Baltimore Conference in 1934. This report calls for a permanent federal housing agency to coördinate local effort, adequate financial assistance by the federal government "in forms likely to stimulate local initiative and local participation in the cost," state control, and financial aid to local governmental units and local governmental or associated local agencies to carry out the actual program. The present administration at Washington deserves the credit of realizing for the first time the need for a national housing program, and for the first tentative steps toward the evolution of such a program. The PWA has taken the initiative in clearing slum areas and developing demonstration enterprises for the low-rent housing of urban groups. The Resettlement Administration deals with the development of rural-industrial communities beyond metropolitan limits. These are the only agencies which directly create new housing facilities. There are 3 others, however, the Farm Credit Administration, the Federal Home Loan Bank Board, and the R.F.C. Mortgage Company, which make loans for housing, and a 4th, the Federal Housing Administration, which facilitates loans by private institutions through partial insurance against losses.

So far, however, these agencies have scarcely scratched the surface of the problem. To meet the need of 6 million low-cost dwelling units in 12 years would call for half a million government-subsidized homes a year; and to build half a million homes at a cost of $4,000 apiece would call for $2,000,000,000 a year. The present federal expenditures for housing are measured in hundreds of millions.

To meet this urgent problem in anything like an adequate manner, we must have a permanent federal agency for housing and a unified national policy, such as is proposed in the Housing Bill introduced by Senator Robert F. Wagner at the last session of Congress, which has the support of all competent experts in this field. It requires considerably larger appropriations than were included in that bill (less than a billion dollars spread over a period of 5 years). Above all, it calls for realization by the states and cities, as well as by the federal government, of the need for action, since the actual con-

duct of governmental housing and a substantial proportion of its financial support must and should depend upon local authorities.

Inevitably however, the awakening must come; and I believe it to be near at hand. When it does come, those in charge of the housing program of the future will need guidance and counsel from the hygienist—for the problem is fundamentally conditioned by health needs. The American Public Health Association means to be ready when the demand arises, and for that reason has created during the past year a Committee on the Hygiene of Housing to coöperate with the Committee on Housing of the Health Section of the League of Nations and to prepare for our own country a formulation of the basic hygienic requirements which the future housing program of America must meet. We have a strong committee representing town planning, architecture, building materials, sanitary engineering, heating and ventilation; lighting, home economics, home safety, sociology, housing surveys and public housing; and by next year we hope to present our first report for your consideration.

For the 65 years of its existence the American Public Health Association has been in the pioneering business. Stephen Smith and the other founders fought for safe water supply and waste disposal when the fundamentals of civic sanitation were strange and unpopular novelties. Their successors have struggled for pure milk, for diphtheria immunization, the control of tuberculosis, adequate health appropriations, and effective health administration—often against heavy odds. We call you today to a new contest even harder than the old ones—the fight for decent hygienic housing for the American peoples.

The objectives of public health today are more complex than those with which we have dealt in the past. The sessions of this Association have of late years been devoted chiefly to the non-living environment and the microbic enemies of mankind. The future will call for consideration of such problems as housing and social security, mental hygiene, and adequate medical care for those in need—problems involving human relationships which are more difficult to handle. The diphtheria bacillus has no friends, but the insanitary tenement has many. We shall require wisdom and intelligence to find the way; but we shall also need courage and determination to surmount the obstacles which bar the road. Yet we of the public health professions have the tradition of the reformer in our blood. Chadwick in England, Shattuck in Massachusetts, Stephen Smith and Hermann Biggs in New York, were not afraid. In their spirit, the American Public Health Association will meet the challenge of the future.

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than three-quarters of a million premises. The disease was successfully checked, but not eradicated.

Spirochetal jaundice is a dangerous rat disease transmissible to man. A high percentage of rats have been found infected where outbreaks have occurred.

Rat-bite fever is transmitted to man by the bite of the rat. Relatively few cases have been reported in the United States, but many rats carry the organism in the saliva, and infection is always possible following the bite of a rat.

Food poisoning caused by infection with *Salmonella* organisms may be caused by rats. These organisms are of animal origin and are frequently found in rats which transmit them to human food by their droppings.

Rats play a part in the spread of other diseases, such as tularemia, rabies, and trichinosis, and no doubt are more of a factor than is generally recognized in spreading various parasites and diseases that affect man.

Food establishments frequently are centers of rat infestation in urban communities, sometimes being almost wholly responsible for a heavy rat population radiating for several city blocks.

With such concentrations of rats the probability of the spread of disease is increased, and where the rats are in proximity to, and often in direct contact with, stores of human food, and where the parasites of rats may be transferred readily to human beings, the probability of disease being transmitted to human beings is correspondingly increased. An example of this is found in the records of the State Health Department of Alabama, which show that in one city typhus fever was contracted by 8 employees of one grocery, 7 of another, 5 of another, and by 3 employees of a grain handling company. In another city in the same state 4 recent cases of typhus were traced to one general merchandise establishment. In all these places there was heavy rat infestation.

In undertaking to control rats in any food establishment, such as a restaurant, grocery, or warehouse, the condition of the entire neighborhood should be taken into consideration. If the establishment is surrounded by well kept premises harboring few or no rats, control measures may be necessary only at the establishment. On the contrary, if the neighborhood contains other rat-infested and rat-harboring premises, any effort to control rats in the food establishment alone is likely to have uncertain results unless the building is made impervious to rats from the basement to the roof, and even then constant vigilance will be necessary. Community work is called for under such circumstances.

It is generally accepted that the only permanent solution of the rat problem in this country is ratproofing, combined with sanitation, and the elimination of rat harbors. Rats will thrive as long as they have food and shelter and safe access from one to the other. Remove the food or the shelter, or place a barrier between the two, and rats cannot survive. The practical application of this principle is sometimes simple and easy and sometimes rather difficult, but usually the manager of a food establishment with a rat problem will find it economically profitable to ratproof the premises and dispose of waste food in ratproof containers. In some places these things are compelled by law because of the health factor, but in many places they are not.

Ratproofing buildings, even those housing food establishments, cannot be expected throughout this country in a short time. When new buildings are constructed and older ones are rebuilt or repaired, however, ratproofing should be included in the plans. Many recent buildings and some in process of con-

struction today lack proper ratproofing devices, which could have been installed during construction with little or no added cost.

If adequate ratproofing features were included in the construction of all new buildings, the rat problem in this country would be solved in a comparatively short time. Information on how to ratproof buildings and premises is available in bulletins of the U. S. Department of Agriculture and of other organizations.

Poisoning offers a quick means of reducing rat populations, and, properly considered as a temporary measure in conjunction with ratproofing as an eventual permanent measure, it fills an important place in rat control.

If the rat problem is confined to one establishment, poisoning operations may be undertaken by the owner of the particular property involved, but if it involves other premises in the neighborhood or is city-wide, it must be handled through a neighborhood or city-wide campaign to obtain satisfactory results.

Since the development of red squill as a raticide, a poison that will kill the rats but is relatively harmless to human beings and domestic animals is available. Rats usually will eat squill baits that are properly prepared and exposed, whereas dogs, cats, poultry, and pigs either refuse to eat these baits or promptly vomit them. Valuable animals should not be allowed access to squill baits, although the chances of serious injury to them are comparatively slight. Nausea and vomiting appear to be the most serious effects of red squill on human beings.

Red squill raticides are made from the bulb of the plant *Urginea maritima*, a perennial belonging to the lily family. There are two commercial varieties of squill, apparently not distinguishable botanically. White squill is used in human medicine, and red squill is used in raticide preparations. The red squill rat poison available on the market is made from the dried and ground bulb and sold as powdered red squill, or under various trade names. The use of liquid extracts of red squill in raticides is being studied.

Powdered red squill cannot be recommended at present as a rat poison without certain reservations, because the product may vary from a satisfactorily high toxicity to practically none at all. In order to obtain a powder of maximum toxicity it is necessary to dry the red squill bulbs under controlled temperature conditions. Some of the squill powder sold for killing rats has been manufactured properly and is dependable; other powder has not, and its toxicity is extremely uncertain. The Biological Survey is working toward a remedy for this situation.

An effort is being made to establish a standard for powdered red squill with a minimum lethal dosage of not more than 400 mg. per kg. of rat. Such a product, when mixed with food in the proportion of 1 part squill powder to 16 parts food by weight makes a bait strong enough for practical purposes. If the squill were a little weaker it would have to be mixed with the food in correspondingly greater proportion, but if the proportion is much greater the acceptance of the bait by the rats is reduced.

In using powdered red squill to destroy rats, the choice of bait is most important. The aim is to destroy every rat with one application; otherwise, the survivors become suspicious and are hard to dispose of later. This requires an ample supply of bait that appeals to the appetites of the rats. In establishments where a variety of foods may be constantly available to the rats, an effort should first be made to get all foods out of their reach a few days before attempting to poison. A further help is to prebait with small quantities

of unpoisoned foods of the kinds proposed to be used as bait. If this prebait is well taken, the poisoning may follow immediately, but if it is not taken, there is little use in putting out poison in the same kind of food. Careful attention to details of this kind can be given by an individual in treating his own premises. In extensive campaigns involving the treatment of all premises over considerable areas, it may be impracticable to prebait because of the added time and expense. Property holders in the area,however, are asked to keep all garbage and food materials out of reach of rats for a few days before the campaign.

The baits most commonly used in the rat poisoning campaigns of the Biological Survey are prepared according to the following formulae, also recommended for general use, though a variety of other foods are sometimes advisable:

a. Meat bait—
1 lb. powdered red squill, high toxicity
15 lb. ground fresh beef, uncooked
1 lb. corn meal

Mix corn meal and squill dry; then mix into meat, adding a very little water if necessary. Squill must be thoroughly mixed through the meat.

b. Cereal bait—
1 lb. powdered red squill, high toxicity
11 lb. rolled oats of good quality
4 lb. corn meal finely ground

Mix ingredients dry and then stir in enough water to make a rather moist dough.

In the eastern states canned red squill rat bait prepared under Biological Survey supervision is being used.

The two baits described above are kept separate and are exposed in teaspoonful lumps where the rats will find them, alternating a lump of meat and a lump of cereal. It is very necessary that enough bait be put out at the first baiting to supply all rats that may visit the premises. Every rat requires a good big teaspoonful of bait, and a dozen spoonfuls put out among 100 rats will show little results. If there are 100 rats, there should be 150 spoonfuls of bait.

Poisoning operations, whether on one property or city-wide, generally should not be undertaken oftener than two or three times a year. Constant baiting with red squill, or most other poisons, particularly if done in a haphazard manner, will often result in educating the rats to avoid poison. If additional control measures are necessary, trapping may be resorted to, or some poison other than red squill may be tried if it can be used safely.

Rat traps will prove effective if the trapper will give a little attention to details. Traps must be kept clean. They should be baited every day with fresh baits such as bread, fresh meat, pecans, bacon, and pumpkin, and location changed every few days. Plenty of traps must be used as it is just as impossible to clear out 100 rats with one or two traps as it is with an insufficient amount of poisoned bait. Cheese is not always the best bait to use.

I have said nothing as yet about the control of house mice. Ratproofing helps to keep out mice but is less dependable than in rat control. Trapping is the best remedy as a general rule, and the same attention recommended for trapping rats will pay dividends in trapping mice.

If poisoning is necessary for the control of mice, a bait can be made as follows:

Mix 1 oz. of powdered strychnine alkaloid with 2 oz. of common borax, and stir dry into 8 lb. of rolled oats. The large-flaked oats are better than the 3 minute type.

The poisoned flakes may be exposed in teaspoonful quantities in places where mice frequent or may be left in little boxes or stations where it will provide a permanent poison supply available to mice at all times. This bait must, of course, be handled with care.

Rats and mice have shared man's food for many centuries, taking what they want and spoiling much more than they eat. The rat has killed man by the millions through transmitting disease germs, and is today the most dangerous and most destructive animal in the world. What we may work for and hope for is a rat-conscious public that will not tolerate rats.

Tentative Method for the Assay of Vitamin D Milk

THE Association of Official Agricultural Chemists, Washington, D. C., has adopted the following tentative method for the assay of vitamin D milk:

The basic method for the assay of vitamin D milk shall be the Method of Assay for Vitamin D in Cod Liver Oil described in the Pharmacopoeia of the United States XI, page 478.

Collection and Preservation of the Sample:

Unless the sample of milk, in the original bottle, can be delivered to the assayer immediately after collection it shall be stored under refrigeration until delivered. Shipment to the assayer shall be made in an iced container. After acceptance by the assayer the milk can be preserved in its original homogeneous state by (a) suitable refrigeration for a period of not more than 1 week, or (b) for a period of not more than 1 month by the addition of 2 drops of 10 per cent formalin and suitable refrigeration.

Administration of Supplements and Duration of the Assay Period:

The calculated quantities of U.S.P. Reference Oil and of the sample of milk may be fed and the assay period varied according to the following options. The U.S.P. Reference Oil and the milk sample must be fed according to the same plan.

1. According to the U.S.P. XI method.
2. The supplements may be fed on the 1st day or in 3 portions on each of the first 3 days of a 10 day assay period. The rats are to be killed on the 11th day.
3. The supplements may be fed on the 1st day or in equal portions on each of the first 3 or 5 days of a 7 day assay period. The rats are to be killed on the 8th day.
4. Admixture with the quantity of basal ration that will be consumed in 7 or 8 days. The unsupplemented basal ration is to be fed during the remainder of a 10 day assay period and the rats killed on the 11th day.
5. Admixture with the quantity of basal ration that will be consumed in 4 or 5 days. The unsupplemented basal ration is to be fed during the remainder of a 7 day assay period and the rats killed on the 8th day.

Evaporated and Dried Milks:

Evaporated or dried milk may be incorporated with the basal ration (paragraphs 4 and 5) or diluted to original volume (paragraphs 1–3).

Mental Hygiene Programs in Schools and Colleges*

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MENTAL hygiene programs have been in operation in our schools and colleges for many years, but without dignity of title. They are as old as the teaching profession, as old as the founding of the college, and as old as the realization that young people bring to school other virtues than intelligence. With this realization has come the knowledge that intelligent progress can be made only by cultivating those virtues which help the child to get along socially and emotionally as well as scholastically in school. There have always been children with good mentality in whom education failed to "take." There have always been faculty members who realized that these "no takes" were not academic but rather failures to get along with the curriculum, or with their neighbors, or with faulty emotional patterns set up in the home. Some faculty members have always had unusual insight into the "outside of school" problems. They have been practising mental hygiene with considerable success for many years. Their work has exerted much influence on the acceptance of the more modern and highly specialized mental hygiene programs of today.

Progress in the development of the modern program began with inquiry into the cause of school failure and with our increasing knowledge concerning how to prevent social, emotional, and scholastic maladjustment. In this field, the mental hygiene movement of the past 20 years, modern clinical psychiatry and psychology have contributed so much that schools and colleges are now ready to accept education in mental health as an objective.[1] Their plans to set up programs to meet this objective are being delayed by 3 major issues: (1) a question concerning how much can be accomplished in prevention and in remedy. This question is difficult to answer partly because of the technical nature of the field and partly because it is difficult to measure results objectively; (2) a hesitation on the part of some administrators to devote resources and employ technically trained staff members in a field where results are intangible; (3) a question concerning practicability in terms of organization, content, and method.

It is our purpose here to review a wide sampling of programs which are now in operation in schools and colleges, omitting a discussion of content and method, which are technical problems,[2]

* Read at a Special Session on Mental Hygiene of the American Public Health Association, at the Sixty-fifth Annual Meeting in New Orleans, La., October 20, 1936.

and emphasizing organization, the place of the program in the school or college, its practical limitations, and results to be anticipated. Any attempt to evaluate a school or college program in mental hygiene must be made practical since it is conceivable that almost every factor in the school and college environment may influence the mental health of the student. It will be necessary, therefore, to limit discussion to the general problems and personnel involved in the program. The discussion must be more general also because of the various types of programs studied, some without and some with particular organization.

We find these programs being conducted at various levels,[3] from that of a complete organization of highly specialized staff, to that of programs carried by a personnel equipped only with the interest in the field. Frankwood Williams[4] states the problem simply: "What should a [college] mental hygiene program be? What it can be. [It is] well to have an ideal of what such a program should be, but if this is not possible, one can do what is possible. This is perfectly safe if we realize that compromise has been made." In regard to personnel he further states, "Who should do mental hygiene work? Not necessarily the one who wants to do it—such desire is open to suspicion, but the one who is prepared. This means more than interest and a desire to be helpful. Work of this kind is done with the head, not the heart."

Impetus was given to the more formally organized programs as schools became more interested in the health of the child—both physical and mental health. In short, the schools are now interested in the *whole* child. Symonds[5] states: "The whole child comes to school and the school is responsible for the whole child while in school—not just the academic child but the whole child who must learn to live as a social being in a social environment." With a growing interest in the value of mental hygiene in character education, the schools are becoming less concerned with subject matter and more concerned with the child and his general welfare. More attention is being given not only to children with established behavior disorders, but to constructive education in mental health for children who are *well* adjusted. Much is being done to help the child adjust to the curriculum; more remains to be done in adjusting the curriculum to the child. Our more progressive schools are finding that children adjust better where prescribed courses are adapted to the individual interests. Thayer[6] states that the curriculum for the most part "remains as one of those immutable forces in life before which children are to bend or prostrate themselves, but which they dare not presume to alter."

Colleges also have developed a growing interest in the student as an individual. There is a definite trend away from dogmatic teaching and toward preparing the student to meet the practical problems of life. This emphasis has been helped by student counselling programs, by newer developments in clinical psychology, recent changes in the thinking of our schools of education, and by the development of student health programs. The colleges have found it desirable to assume certain responsibilities for student health and many now have well organized programs, including classroom teaching in hygiene and preventive medicine, physical education activities, and student health service. There are splendid opportunities to include subject matter in mental hygiene as part of courses in hygiene, and some college hygiene departments are devoting sections in their courses to this subject. Further de-

velopment in this field depends upon increasing interest and the selection of appropriate teaching material.

College physicians have long recognized the intimate relation between problems of physical and mental health and have stressed the desirability of including mental hygiene as part of the student health service program. This has evident advantages. Mental maladjustment often appears in the guise of physical symptoms and the college physician is in a unique position to remove this guise and institute early remedy for mental troubles. In this work he is aided by the intimate nature of the physician-patient relationship and his understanding of the particular problems of the college age group. This group has its special mental health problems and deserves special attention. It is first a relatively homogeneous, selected, intelligent, and coöperative group. The age represents the beginning of adult independence of thought and action, passing through the change from home guided to self initiated policy. Emancipation from the home as described by Williams [7] is presumed to *be,* but more often *is,* in process. While in college the student should be afforded the opportunity to prepare himself for adjustment to some of the major problems of adult life. This is the outstanding chance for him to remedy certain faulty emotional thinking from early life and to fortify himself with certain elements needed to meet later emotional responsibilities as a parent and an educated member of the community.

Recognizing the growing interest in mental hygiene programs in schools and colleges, it seems appropriate to study the means by which these programs are being put into practice. There appears to be no uniformity in this regard, the various means depending upon the most appropriate opening and point of greatest interest. Many colleges still depend upon the informal faculty-student relationship in these matters. The most satisfactory programs are being conducted in several of the larger universities as a part of the program of the student health service and department of hygiene or preventive medicine. Psychiatrists are employed by a few of our universities as full-time members of the health service staff. They receive assistance from psychologists and psychiatric social workers, and are engaged in both remedial and teaching work. In several other universities and colleges, psychiatrists are employed as part-time consultants with or without technical assistance. Some universities are able to use the services of psychiatrists in their medical schools or in nearby state hospitals.

Stanford University has two psychiatric consultants in the Student Health Service for Men, one a member of a state hospital staff, and the other head of the Department of Psychiatry in the Medical School. In our experience it was early discovered that several members of the university faculty were working on student mental hygiene problems from different approaches, and sometimes with duplication of effort. This group, composed of the chief physician for men and chief physician for women, the deans, student counsellor, assistant registrar and personnel officer, were brought together for informal discussion of common problems. Regular meetings are held, often with the consulting psychiatrist and occasionally an interested faculty member is invited to sit in on the discussions. It is hoped later that we may call in members of the Department of Hygiene, the School of Education, and the Department of Psychology to set up informational courses in mental hygiene.

Psychiatric consultants in a college are occasionally called upon to partici-

pate in the teaching program, but more frequently courses in mental hygiene, if taught, are given as part of the hygiene, psychology, or education curriculum. These departments bring to the teaching program different points of emphasis; psychology often considers mental hygiene in terms of abnormal psychology. Education is more interested in teaching material which will help the teacher with school problems in growth and development, while departments of hygiene tend toward correlating information on physical and mental health. The latter approach has the advantage of emphasizing the positive and preventive aspects of physical and mental health. The curriculum in hygiene at Stanford University lends itself well to this integration. Physical and mental health are discussed as two inseparable aspects of hygiene. Members of the hygiene faculty furthermore participate in a course given in the School of Education called "The Physical and Mental Health of the School Child."

It is important that courses in mental hygiene be available to students in Education. Fenton [8] has said that the "most serious hindrance to efforts along the line of mental hygiene in schools is inadequate training and understanding of the average school administrator and classroom teacher." One group of teachers in particular should receive very careful training in mental hygiene. This is the group who plan to enter the field of student counselling. Teachers in this field have certain unusual contacts with the social and emotional problems of pupils and should be prepared to understand them more thoroughly than the average classroom teacher. The report on "Character Education through Individual Counselling," of the National Education Association [9] has included the following statement:

> The function of counselling should be not alone the correction of (simple) maladjustment but also the prevention of maladjustment in the normal individual. As in the practice of medicine, the emphasis must be placed on keeping healthy people healthy. Adjustment of problem cases should never overshadow constructive assistance to normal people.

On a less technical level, the classroom and departmental teachers should bring to their school work some background in mental hygiene from the college. They should know the mental health implications of growth and development, understand some of the behavior problems of the young child and adolescent. They should know *why* a shy child is shy, what to do with the attention seeker, how to interest the day dreamer—these and other problems, and finally, but most important, they should know when to refer these problems to more skilled workers. Many of our teachers are doing fine jobs in mental hygiene. But *where* have they learned except through interest and understanding? How much more constructive their accomplishments, had they received some information in their colleges. And apparently few have had the opportunity to receive such information. This is revealed in the survey made by Averill [10] for the White House Conference and by Elkind [11] in a survey on teacher training in Massachusetts. He reports that 78 per cent of students enrolled had no opportunity to take such a course and that only 15 per cent of the institutions offered courses in mental hygiene. Apparently we must lay the blame for some of our mental health problems in the schools on the inadequacy of college programs rather than upon the inadequacy of teachers.

Failure to provide for mental hygiene teaching in colleges is reflected into the lower school levels where the extent and placement of programs vary con-

siderably. The majority of elementary schools have little or no program as such, except for some remedial work for the handicapped child. Some elementary schools are fortunate enough to receive help from a nearby community or child guidance clinic, or have a consulting psychologist or psychiatrist on the staff. But more often the remedial and educational program is carried by the home room or visiting teacher. A few of our larger school systems have established full mental hygiene staffs, consisting usually of a part-time psychiatrist, psychologist, full-time psychiatric social worker, and educational counsellor.

In one of our eastern states school mental hygiene is initiated and supervised through the facilities of the state hospitals. In other states the program receives support from the state or local mental hygiene societies. In New York State work in mental hygiene is organized as part of a special state department, with Dr. Patry [12] in charge. In California the Division of Juvenile Research under Dr. Fenton [13] has contributed much. This organization has sponsored travelling clinics, using the services of members of the state hospital staff and the best informed people in each community. Where psychiatric consultation was not available, groups of informed and interested teachers were organized as study clubs, carrying the program at the level of their limitations. An interesting program is being conducted in the San Joaquin Health District in California where 2 young women trained in education and psychiatric social work are dividing their services between the health department and schools. In Berkeley, Calif., a Coördinating Council [14] has been working on problems of community welfare (including problems of mental health) for a number of years. The Council is composed of the heads of the city schools, health department, police department, playground and recreation department, department of charities and social welfare, probation officer and judges of the justice and juvenile court. This is a planning commission only, with no executive authority except as its work is directed by leaders of thought in the social welfare of the community. The trend in school mental hygiene programs seems to be toward the inclusion of this as a part of broader community health and welfare programs.

In programs which vary so much in extent and organization and which encompass such an intangible field of human interest, one must anticipate many limitations in results. The college fortunate enough to have an organized student health service with psychiatric consultation and classroom teaching in mental hygiene is accomplishing very satisfying results. But the smaller college less fortunate in resources is also making valuable contributions to improvement in mental health, when the administration is sympathetic toward these problems and when faculty members recognize that students have human as well as scholastic difficulties. Lower schools are fortunate who have facilities for professional care of the handicapped, for counselling service, and who have on their faculties teachers trained in college to recognize and identify early deviations from usual behavior in their pupils.

The most serious limitations in the teaching program aside from the adequate training of teachers arise from problems of course content, placement of courses in the school or college curriculum and the tendency to stress the negative rather than the positive aspects of mental health. Best results in teaching may be anticipated where mental hygiene subject matter is in-

cluded incidentally in other parts of the curriculum and where it becomes closely integrated with subject matter in physical hygiene and preventive medicine.

The most serious limitations in the remedial program arise from the failure to identify serious problems early. This can be obviated only by more careful training of teachers, nurses, and physicians. A second limitation arises from a shortage of specialists in psychology and psychiatry trained to understand the problems of the school child and college student. A third limitation in the remedial program comes from the fact that treatment is time consuming; that remedy can reach relatively few; and that many who would profit by early attention from skilled workers are not seen. This is a large group which might be reached by instruction in mental hygiene. Here lies one of the major challenges in the field of health education.

The practicability of the mental hygiene program in schools and colleges depends on our concept of its meaning and a realization of its limitations. If we recognize that it is helping to improve the mental health of young people even to a limited extent, then we may say that much has been accomplished in the past and that much more can be accomplished. According to this concept, any attempt to improve mental health is better than no attempt, any progress leads to further progress and success is limited only by our preconceived idea of how much should be done. We must consider this program as a definite and inseparable part of the broader program which has to do with the protection of human health and welfare. The fight against mental ill health is crudely parallel to the fight against tuberculosis. Only a few years ago we felt that there was little to do in tuberculosis but care for the advanced cases in sanatoria, just as we now care for asylum patients. Progress was then made in the early identification of the disease, just as we are now learning to pick up early deviations from usual mental health. There is now promise that some of the suffering from tuberculosis may be preventable. May we not also hope that some of the mental unhappiness of adult life may be prevented as mental hygiene programs meet more adequately the problems of earlier life?

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EDITORIAL SECTION

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YELLOW FEVER

THE story of yellow fever is a scientific romance. When we believed we had run the disease to its lair and knew a great deal about it—its habitat, its method of transmission, etc., the discovery of the jungle type comes and shows us that we are still far from knowing all. From the practical standpoint the knowledge on which we have based our actions since the monumental work of Reed and his committee holds good as far as it goes, as is attested by our conquest of the disease in many endemic foci. The recent discoveries recounted on another page of this *Journal*, are intensely interesting scientifically, and present practical problems for solution.

One inevitably turns to the history of the disease and the ideas concerning it. In 1931, Henry R. Carter,[1] than whom no one was better qualified to speak, said: "*Yellow fever is contracted by man in nature from the bite of a mosquito, Aëdes (Stegomyia) aegypti (Linnaeus), itself infected by having fed on a man sick of that disease, and, so far as known, is in nature only thus contracted.*"

Again, "It is a disease of collections of men—civic rather than rural." The latter statement was held as true for a long time; the former since the work of Walter Reed.*

Among the older men who deserve special recognition, Richard D. Arnold, of Savannah, Ga., stands high. In 1838[2] he wrote, "Very few, nowadays, believe in the contagion of yellow fever." In 1871, when yellow fever appeared in Charleston, he was consulted by the Mayor of Savannah, and said: ". . . I, with my positive conviction as to the nontransmissibility of the disease by person

* We must recognize here the remarkable studies of Carlos Finlay, who held views that Reed proved, and who showed his remarkable acuity by selecting the right mosquito out of the 500 or 600 varieties found in the tropics. He gave to Walter Reed the eggs from which the mosquitoes used in his experiments were raised.

or luggage. . . ." He said also, "Yellow fever is strictly a city disease (not necessary for the city to be large), the disease contracted in the city has never in these parts been known to have been propagated in the country. Where, then, is the ground for the contagionist to stand upon? . . . I combat the contagiousness of yellow fever because I do not believe in it and because the unfounded belief in it creates undue panic, needlessly obstructs commerce, interrupts all communication between sister cities, and cuts short the ordinary charities of social life." He said further that although some persons had been constantly coming to Savannah from Charleston, not a solitary case had occurred from such intercourse, and that, in 1838 and 1839, yellow fever prevailed extensively in Charleston, and in 1839 in Augusta, yet in spite of free intercourse between those cities and Savannah, no panic was created. In 1869 he said, "I do not believe in its contagion or its importation by persons . . ." Repeatedly throughout his life he combated the contagiousness of yellow fever. He once referred to a doctor from Charleston who believed in the contagiousness of yellow fever, as the "Archbishop of Contagion." When this was recalled to him, he said, "I do not recollect the term, but it is well merited and it sounds very like me."

Of course he made mistakes. The agency of insects in the transmission of contagious diseases was at that time hardly suspected. The work of Theobald Smith, Ronald Ross, and others, came many years later. Dr. Arnold pointed out that malarial fever, which he called "paludal fever" (far in advance of his time) was found in the country and not in cities to any extent, whereas yellow fever was a disease of the city and not of the country.

While our object here is to show the ideas of Dr. Arnold concerning yellow fever, we may recall that he was one of the founders of the American Medical Association, and its Vice-President in 1851. It is of especial interest to the members of our Association that he was a member of the Sanitary Convention called into being by the Philadelphia Board of Health in 1856, the first meeting having been held in 1857.[3] Dr. Arnold was the presiding officer at the Convention in Boston, June, 1860, the last one held, the Civil War having brought these meetings to an end.

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ATTACKING DIABETES AS A HEALTH PROBLEM

WITH the marked reduction in the prevalence and mortality of many of the infectious diseases which formerly constituted our major public health problems, more and more attention is being directed to the great prevalence of chronic diseases of later life. Many of these, such as cancer, and diseases of the cardio-arterio-renal system still present most difficult problems because of the lack of sufficient scientific knowledge as to their cause or means of control. There is one, however, diabetes, in which a widespread application of the available medical knowledge cannot fail to bring about a distinct prolongation of life and a marked reduction of invalidism.

For the past 8 years Bolduan has been urging an organized attack on diabetes as a public health problem. Several years ago he was instrumental

in having the subject studied by a special committee of the New York Academy of Medicine, the report of this committee being presented in the form of the Hermann M. Biggs Memorial Lecture by Dr. H. O. Mosenthal in April, 1933. Toward the close of 1934, with funds donated by Lucius N. Littauer the recommendations of the committee were put into effect by the organization of the New York Diabetes Association. The objectives of this association are:

To act as a clearing house for the study of diabetes as a health problem, and to devise measures for the control of the disease.

To assist in the formation of an association of clinics dealing with diabetes.

To stimulate more effective coöperation between clinics and hospitals in the treatment of diabetes.

To develop more extensive and more continuous graduate courses of instruction for physicians.

To carry on health education of the public in all matters pertaining to diabetes.

To assist in the preparation of exhibit material which can be used in the instruction of diabetics attending clinics.

To attempt a solution of the problem of providing insulin to the indigent.

To extend our knowledge of diabetes by the interchange of views at suitable meetings.

To study the needs of the various parts of the city to the end that adequate facilities for diagnosis and treatment may be generally available.

The New York Diabetes Association has just issued a report of its first year's work. During this time it has prepared a handbook for the guidance of diabetics, compiled a list of diabetes clinics in New York City, sponsored radio broadcasts, arranged meetings for physicians, and has generally served as a clearing house for information on all phases of diabetes. It has also collected data regarding the prevalence of diabetes, the number of cases in New York City under the care of private physicians, clinics and hospitals, the length of stay in hospitals, the mortality in hospital cases, the lengthening of life since the introduction of insulin, the relative mortality in married and unmarried women, and among Jews and non-Jews. Altogether the record of accomplishments is one of which the Association may well be proud.

Those who visited the scientific exhibit held in connection with the Milwaukee meeting of the A.P.H.A. will perhaps recall the interesting tables, charts, and graphs on diabetes shown there by Bolduan. These gave an excellent picture of diabetes as a public health problem and summarized the steps which a community might take to control the disease. We are informed that this series of charts and graphs is about to be reproduced in the form of a pamphlet by the New York Diabetes Association. Wide dissemination of this kind of information should contribute much to a more general attack on diabetes throughout the country. With the prevalence of diabetes estimated at from ½ to 1 per 1,000 of population, such an attack is distinctly in order.

to defend social agencies or public departments when they are being criticised, but seldom to do that slow, steady, difficult job of humanizing the processes, the clients, and, indeed, the social workers themselves, which so greatly needs to be done.

National Social Hygiene Day—Wednesday, Feb. 3, 1937, will be the day. "Plans include newspaper and magazine articles, a national radio program, and other attention-attractors."

Plans for the day are in charge of Dr. Jacob A. Goldberg, secretary, Social Hygiene Council of Greater New York. Address: American Social Hygiene Assn., 50 W. 50th St., New York, N. Y.

"Shameful Record": Editorial of the Month—Said *New York World-Telegram,* Dec. 1, 1936:

America, in 1936, is making one all-time record of which we must be heartily ashamed. Traffic deaths this year will number 37,500—an increase of 500 over the bad year, 1935. So the National Safety Council estimates.

It's true that the rate of increase will be smaller than it has been since 1932. It's true that the death rate has increased much less rapidly than gasoline consumption. And it's true, apparently, that city streets have become a little safer, with fatalities in small towns and open highways responsible for the ghastly gain.

But that is unimportant compared to the butchery of 37,500 human beings and the maiming of hundreds of thousands more by carelessness and speed. Horrified by the death toll that civil war is taking in Spain, we have small reason to congratulate ourselves on our superior civilization as long as we cannot or will not control ourselves and our traffic.

Syphilis Education in a New York Clinic—"Recommended practices and procedures" for medical social service in a syphilis clinic in New York City includes the following under "Public Education":

As a means of keeping informed and of improving professional technics and standards of work, medical social workers in syphilis clinics should make it a point to attend and participate in institutes, courses of lectures, committees, or other activities on the subject of syphilis. They should also accept professional responsibility for spreading public education on available resources for diagnosis and treatment of syphilis and unmet community needs.

In *Better Times,* 122 E. 22d St., New York, N. Y. Dec. 7, 1936. *35 cents.*

When the State Legislature Meets—More than a few health workers will soon be much concerned over what happens at the state capitol when health appropriations and other legislation come up for consideration.

For such is offered a recent pamphlet of Social Work Publicity Council, 130 E. 22d St., New York, N. Y.. "Lobbying for Social Legislation," is by William T. Kirk. 18 mimeographed pages. *50 cents.*

This is a study and report of the actual legislative experience of a group of lobbyists notable for their services to health and social work and to causes of significance to health and social workers.

"Lobbying for Social Legislation" is for agency executives and other staff members and volunteers who may be called to serve at the state or national capitol. It is for those who wish to stand back of their lobbyists at the capitol. It is for those who wish to understand the course of events as health-social objectives are sought through legislation. Brief chapters cover such topics as: The nature of lobbying; bill drafting; stages in the progress of a bill; methods used in opposing bills; the attitude of legislators toward lobbyists.

The Austin American Suggests a Way of Life—"This editorial originated entirely with the newspaper and presents a most progressive public attitude toward the whole subject of ve-

nereal disease control," writes Dr. E. O. Chimene, Austin, Tex., Director of Public Health, when he sent an editorial in *Austin American*, "For a Disease-Free Austin," from which we quote only a small part:

Society's problem recorded in the Old Testament is a problem now that Austin police have attacked vigorously. Austin police, in a drive led by Capt. Rex Fowler of the detective department, have attacked prostitution with the only weapons available to them, the punishment of those in the traffic, at best sporadic and temporary. But their fight reminds Austin this frankly is not an issue of conduct or morals, but deals with the carriers of diseases, and deals with control of diseases that affect the lives of youths and of still more innocent persons and the physical soundness of a generation of unborn children.

Prostitution flourished a few years ago under the harried efforts of authorities to restrict it to the old red light districts. There, in theory, a little supervision could be enforced to keep down its breeding of gonorrhea and syphilis. . . .

Austin owes it to the youths who come up to universities here to keep the city free of these disease breeding places. Austin owes the same duty to its own youth; and owes the duty to itself of looking upon these conditions frankly, of speaking openly of syphilis and dealing with it just as it would with any other contagious disease. . . .

Then follows a straightforward presentation of the "effects of contact with these disease carriers" which "go far beyond the moral results of the illicit relationship."

Others May Fall for It—Health workers as well as physicians need to check carefully the "Greek gifts" offered by department stores and other commercial concerns.

The *Journal*, Indiana State Medical Assn., says:

Some time ago we directed attention to a new-fangled "health test" for babies which was being operated in northern Indiana, and suggested that physicians be a bit chary about participating in such a program. We are reminded of this again upon receipt of a newspaper clipping which detailed the plan of operation of the scheme in another Indiana city. The plan is to interest a local group in the enterprise, offering them either a flat sum or a commission. The mothers are told that the proceeds of an entertainment to be staged during the contest, and to which the mothers are asked to sell 20 or more tickets will help pay the expenses of the contest, and as a further reward, the mother is entitled to have a picture of the child made at a local department store. Just why physicians lend themselves to propositions so wholly commercial is beyond us. It stands to reason that if the physicians of one community fall for the racket, it will be tried in other Indiana centers. Obviously the thing to do is to refuse to have anything to do with such schemes.

Reporting State Health Education—Quite satisfying is the public health education section of the New York State Department of Health for 1935.

Under public education division in the index we find

bureau of visual education; carbon monoxide education; clippings and newspaper publicity; conference of health officers and public health nurses; field service; field trips; foreword by deputy commissioner of health; 4-H club activities; future needs and plans; health-mobile service; lye legislation; marihuana publicity; new motion pictures; regional distribution of motion pictures; publications; radio plays; electrical transcriptions; ragweed campaign.

Unfortunately the above does not give a full picture of state health education activities. Under tuberculosis division, the index mentions educational activities, and exhibits. An exhibit is noted under syphilis. Educational activities, and lecture attendance comes under social hygiene division. The sanitation division offers motion pictures of sewage treatment plants. Public health nursing reports an educational program, extension course, and leadership classes. Maternity division has educational activities, exhibits, and prenatal letter service.

What a pity that the index could not include "public health education—maternity division"; "public health

education—public health nursing division"; "public health education—sanitation division"; and so on.

Likewise an index summary of all types of surveys and studies made in all divisions would be of value to administrators, research workers, students.

Incidentally, we receive few annual reports from state health departments.

"Keeping Fit" in Milwaukee—George A. Dundon, Director of Health Publications, Milwaukee Health Department, reminds us that

Outside of the nationally syndicated "health columns" it has usually been found difficult to get newspapers to print verbatim health advice, especially from local sources, and for any great period of time.

Mr. Dundon suggests that one reason for this difficulty has been the length of the material offered to editors.

Perhaps this difficulty is due to the fact that health articles are usually too long. At any rate, Dr. John P. Koehler, Milwaukee's Commissioner of Health, has found ready acceptance by the newspaper of a series of short, one or two paragraph, health hints which the Wisconsin News of Milwaukee has been running daily for the past 2 months under the title of "Keeping Fit." I am enclosing clippings of these articles used during the month of October. You may note the wide range of health subjects which are being discussed. Arrangements have been made to provide timely articles with reference to any unusual day in the month, such as Hallowe'en, Armistice Day, or Thanksgiving. Otherwise enough articles for a 2 or 3 weeks' run are supplied so that compositors may set them up outside of rush periods, and make them readily available by make-up men on the newspapers. The "Keeping Fit" series is run on the front page of the "green" section of the newspaper.

Tuberculosis Training Institutes—Two such institutes have been announced for 1937.

The first will be held in New York, February 8 to 20, and the second in Los Angeles, Calif., probably during the last 2 weeks of June. Definite arrangements for this institute will be announced later.

The New York institute will open on the morning of February 8 at New York University in Washington Square, New York City. The institute is planning particularly for workers who are now employed as tuberculosis secretaries or staff members or in some other capacity by tuberculosis associations. It will also be of value to those who expect to be employed or who are looking to possible employment in the tuberculosis field. A number of tuberculosis secretaries who took the course 8 or 10 years ago, will repeat it and find it worth while. The course is also recommended for board members and public health nurses provided they can give their entire time to the course.

No part-time students will be taken for the course and auditors will be admitted to individual sessions only by special invitation. Registration for the course means that the student will take the entire 2 weeks.

For descriptive circular and application blanks, write to Dr. P. P. Jacobs, at the National Tuberculosis Association, 50 West 50th St., New York, N. Y.

Health Education in Journal—References in the *American Journal of Public Health* for November, 1936:

In "Reporting Progress" by Parran:

Public health needs should be interpreted to the people (page 1071). . . .

How far we go depends upon our ability as health workers to get together and to work together, and upon the capacity of the public health profession to interpret such work to the citizen and taxpayer.

This last possibility begins to look somewhat more promising. In the past we have thought somewhat wistfully that public health might be sold to the public if we could train health officers to be orators and advertising writers. That method is as impractical now as it ever was. Yet so far as gaining our objectives is concerned, we are fortunate in that sales resistance is decreasing. It is becoming obvious that the taxpayer can save money through the prevention of disease. He is beginning to ask: "Why should we pay pensions for the blind and do so little to prevent blindness? Why should we add to the burden of those made destitute in their old age by chronic preventable sickness? Why should we pay widows' pensions when we could prevent the death of the breadwinner?" There has been added, therefore, to the humanitarian appeal of public health—and humanitarianism is one of the last of the acquired human characteristics—the direct

"Otto Neurath, Social Showman"—Many of us met Dr. Neurath at New Orleans. Many others were introduced to him by the article, "Social Showman" in *Survey Graphic,* 112 E. 19th St., New York, N. Y. Nov., 1936. *30 cents.*

Dr. H. E. Kleinschmidt has supplied the following sketch:

Dr. Otto Neurath, director of the International Foundation for Visual Education of The Hague, and his associate, Miss Marie Reidemeister, are spending several months in this country consulting with health and welfare agencies. Dr. Neurath is the originator of the isotype method of presenting facts. He attended the meeting of the American Public Health Association at New Orleans and gave a paper illustrated with slides at a Health Education Section meeting. En route he visited a number of agencies and institutions, including the American Medical Association, Rosenwald Museum of Industry in Chicago, University of Iowa, Talledaga (Ala.) University. His headquarters are in New York where he is consulting with a number of groups, including officials of the New York World's Fair, New York public schools, New York Maternity Center, and the National Tuberculosis Association, which organization is planning an entire exhibit to be executed in the isotype style.

Isotype is an international visual language adaptable for the poorly educated as well as those of high intellectual level. It makes use of standardized symbols arranged according to a consistent pattern. While the symbols always carry the same meaning, their combinations are almost infinite. Isotype seems peculiarly adapted for popular health education.

Hygeia, December, 1936—In this issue (535 N. Dearborn St., Chicago, Ill.) will be found:

The lessons of biology (fountain of youth undiscovered) . . . Temperature, temperament, and thyroid (radio talk) . . . Victims of advice ("parlor professionalism and dinner-table therapy") . . . Common household accidents (why, and what to do) . . . Healthful sweets for the holidays . . . Medical routine from birth to adolescence (three alternate plans for each of 3 periods) . . . Microbes: servants of medicine (the good they do) . . . Spirochaeta pallida . . . Kidney disease (use and abuse of water and salt) . . . Frostbites (fallacious ideas) . . . What killed "the cattle of Egypt" . . . The doctor abroad—Italy . . . Sculpture with human material (physical education) . . . The dumb cluck becomes a scientific milkmaid . . . Exit the monster (a play for children) . . . Fritz Schaudinn (discoverer of syphilis cause) . . . Mottled enamel ("a modern plague") . . . Medicine keeps step with the machine age . . . Radio announcements (A.M.A. broadcasts via N.B.C. blue network) . . . New books on health . . . Questions and answers.

Under "School and Health":

Guiding adolescent hygiene . . . To make Christmas happier and safer . . . A "see for yourself" program in health education (St. Louis) . . . Units of work in the junior high school (Norwood, Ohio) . . . Bicycle safety education.

Recorded in Headlines—Striking evidence of widespread newspaper coöperation in the fight on venereal diseases is offered in a group of 6 sheets of newspaper page size, 17 by 24 inches. Three of them reproduce illustrated feature pages from *Chicago Sunday Tribune* for Oct. 6, 13, and 20, 1936. On one sheet is reproduced the headings of a series of 20 articles which appeared in April and May, 1936, *Washington Herald,* Washington, D. C. Two other sheets review by means of headlines from 1935 and 1936 newspapers the increase of "freedom of the press" when it comes to naming the "social diseases." Prepare the way for your local newspapers, and lead them in their first steps of independence by making use of these sheets. Address: American Social Hygiene Association, 50 W. 50th St., New York, N. Y. The set for *35 cents* postpaid.

What to Tell People about Nutrition—Alertness in keeping up with developments, plus caution in presenting untested conclusions, should be attitudes of the health department toward nutrition discoveries, stated Dr. E. S. Godfrey in a recent meeting.

Among other nutritional functions of a health department mentioned by Dr. Godfrey were:

1. To interpret to the people facts and factors, knowledge of which, if put into practice will enhance the well-being of the individual.

2. To protect people from insanitary, polluted, and harmfully adulterated foods.

3. To set before the people knowledge of recently approved valuable new foods or food adjuncts.

4. To assist the physician with nutrition information.

5. To work for the creation, conservation and maintenance of good health among the people.

6. To stand between the quack or zealot and the citizen and to dispel false ideas, half-truths, prejudices and superstitions which lead to living practices harmful to health.

7. With relation to fads and faddists, to substitute truth for pseudo-science.

8. In the matter of commercial exploitation, to be alert to correct harmful as well as misleading statements without overlooking the beneficial results of the commercial popularization of certain products, ethically and truthfully represented, or the valuable research done by competent experts.

In *Health News*, Albany, N. Y. Nov. 2, 1936.

HONORABLE MENTION

To Westchester County (White Plains, N. Y.) Department of Health: Honorable mention for an annual report with a 2 page table of contents.

FOR EDUCATION OR REFERENCE

Even single copies of some of these publications placed with editorial writers, or leaders in certain organizations, might have considerable results.

"Communicable Disease Control," by Dr. W. W. Peter, medical director, Navajo Service, Window Rock, Ariz. A memorandum to physicians, nurses, and teachers. *Free.*

"Concerning Diabetes," by Dr. A. A. Hornor. John Hancock Mutual Life Ins. Co., Boston, Mass. *Free.* What it is; care of diabetic; patient must do his part; preventing.

"Health, Diseases, Drugs, and Sanitation." List of publications on those subjects for sale by Supt. of Documents, Washington, D. C. *Free.*

"Insects." A list of publications for salt. Supt. of Documents, Washington, D. C. *Free.* Includes 40 titles on mosquitoes.

"Menus and Recipes for Lunches at School," By Carpenter, Hann, and Yeatman, Bureau of Home Economics, Dept. of Agriculture. Supt. of Documents, Washington, D. C. *10 cents.* Inexpensive dishes easily prepared where the equipment is limited. The Bureau will be glad to send a copy to any teacher or leader in a school lunch project.

"Pollution of the Animas River," by J. R. Earp, New Mexico Bureau of Public Health, Santa Fe. Reprint. *Free.* A water supply problem of two states.

"Shall Health Education Be Carried on by Health Workers or by Paid Advertising," by H. N. Calver, 30 Rockefeller Plaza, New York, N. Y. *Free.* Reprint of Milwaukee convention paper.

From American Medical Assn., 535 N. Dearborn St., Chicago, Ill.:

"Highway Health Safeguards." Health pointers for tourists; travel information from states and provinces. 2 pp. *10 cents.*

"Facts About Gonorrhea." Small folder. Should be inexpensive in quantity. *5 cents.*

"Facts About Syphilis." *5 cents.* This and the next above were adapted from publications of the New Mexico Bureau of Public Health.

BOOKS AND REPORTS

Syphilis Sive Morbus Humanus: A Rationalization of Yaws So-Called —*By Charles S. Butler, M.D. Lancaster, Pa.: Science Press Printing Co.,* 1936. 137 pp. Price, $3.00.

The chief object of this book is frankly to show that yaws is a form of syphilis seen in the tropics. The author discusses questions which have been "matters of controversy for 175 years or four generations."

After an introduction, in which "authority" is castigated, with quotations from William Buchan among others, we come to Chapter I, which is a most interesting story of syphilis, showing extensive and profound research. It goes into the medicine of the Bible, showing that the leprosy of the Old Testament included at least 5 diseases and that a considerable amount of the confusion has persisted until quite modern times. Indeed the author holds that the errors made by some notable authors are due to the close adherence to the Biblical account. Chapter II, History of the Venereal Diseases, is extremely interesting. The author is a strong advocate of popular education concerning the dangers of venereal diseases and advocates the use of newspapers and moving pictures for this purpose. He believes that such patients should be treated like other sick persons.

The chapter on Hero Worship goes further into the history of venereal diseases and combats the idea that syphilis is of American origin. "From the year 1400 to 1936 all nationals, creeds, and professions have put forth much effort and ingenuity and displayed much irascibility in efforts to pin this ill-smelling flower upon any other people than those who were writing about it." It was pinned upon the American Indian.

> It is to the eternal shame of the medical profession that, knowing the epidemiology of syphilis, and knowing the claims made by those who attributed this disease to the return of Columbus's sailors from the first voyage, knowing that only 44 men returned to Europe from this voyage, nevertheless lent their full professional force to the propagation of this monstrous libel. The whole scheme is shot through with discordance, meanness, and mendacity.

This chapter also embraces a discussion of slavery and yaws and tells of 7 other diseases almost certainly introduced to the New World through the African slave trade.

The next chapter treats of yaws, framboesia, and treponematosis. Chapter V is on Nomenclature. The author scores the lack of accuracy shown by physicians who, he says, we would expect above all others to be keen for precision in names and for an adequate system of nomenclature, but are the most slovenly of all scientists in their use of scientific names. This is illustrated by the confusing terms applied to the germ of syphilis, discovered in 1905, and named Schaudinn, "Spirochaeta pallida," which like several other names, was shown to have been preempted by other authors. Treponema pallidum is now the proper zoölogical name. In corroboration of this, the reviewer recalls a booklet on syphilis, written by a prominent officer of the American Social Hygiene Association, in which the wrong name was used. On calling the author's attention to it, he was told that this was purposely done

because the public was accustomed to this term and would understand it better than the correct one!

In Chapter VII, On Adversaries, the author takes up one by one a number of writers whom he considers worthy of notice. Quoting at some length from a few of them, he demonstrates their fallacies and emphasizes the points in which they were correct.

The last chapter, Argument, is a strong plea for educating the public concerning syphilis. It is proved conclusively, in the reviewer's opinion, that syphilis was known in pre-Columbian times, and that there is no evidence that the disease originated in this country and was carried to Europe by the sailors of Columbus. Much of this chapter is in question and answer form.

This work is extremely interesting and shows profound study of the question as well as extensive personal experience. As the author says, he has never pulled his punches, and asks no quarter from those who do not accept his conclusions.

The book is abundantly illustrated and, as a frontispiece, carries a picture of the "First Syphilitic" from a woodcut made by Albrecht Dürer (1471–1528), with its history. In the Zodiac above the syphilitic's head is "1484," supposedly the date when syphilis first made its appearance in Nuremberg.

We cannot but think that the author has proved his points. The book is commended to all students of this most interesting subject.

MAZYCK P. RAVENEL

Syphilis and Its Treatment—*By William A. Hinton, M.D. New York: Macmillan*, 1936. 321 pp. Price, $3.50.

This book presents in a fairly complete way the principles of the clinical management of syphilis. The fact that the technic for administering drugs has been omitted is rather unusual, the reason of the author being that such procedure should be learned from demonstrations on patients and not from studying a book. It will be of interest to determine the degree of success which is attained if this method is applied.

From a public health standpoint the book is incomplete. No description of modern epidemiologic procedures in the control of syphilis is included, although such measures are of fundamental importance not only to the health officer but to physicians in private practice. If such measures are not brought to the attention of medical students there is little hope that the physician of the future will appreciate the importance of coöperating with health authorities in measures which relate to the control of these diseases. R. A. VONDERLEHR

Statistical Methods in Biology, Medicine, and Psychology—*By C. B. Davenport and Merle P. Ekas. (4th ed.) New York: Wiley*, 1936. 216 pp. Price, $2.75.

This is essentially a handbook of methods and formulae. The 7 chapters cover: I. Measurement of variation; II. Seriation, centering constants, variability, sampling; III. Frequency distributions; IV. Analysis of variance; V. Correlation; VI. Heredity; VII. Index numbers and time series. Recent work is included in the book; for example, the work of R. A. Fisher on the variability of small samples. Certain subjects which the public health statistician would find useful are omitted; for example, rates, life table construction, and fitting of curves other than the frequency type.

Nearly a third of the 216 pages are devoted to a very useful set of appendix tables including algebraic formulae, logarithms, constants of the normal curve, probabilities including chi square,

roots, powers and reciprocals from 1 to 1054 and so on.

The book will easily slip into the coat pocket; its compactness is due largely to the small type used (6 point for the text?). The font is clear, however, and the mechanical work good. The book appears to have relatively few errors.

Giving as it does, a considerable amount of information at a modest price, the book is something of a bargain. It is recommended to all who require data on statistical methods of the type developed by the Pearsonian school. A. W. HEDRICH

Creative Re-education—*By Frederick Peterson, M.D., LL.D. New York: Putnam*, 1936. 112 pp. Price, $1.00.

Seldom, when reading a book on "education," does one find his thinking elevated to and sustained at a high level of humanitarian and spiritual values. Usually these values, when present, must be extracted painfully from a mass of psychological and pedagogical discussion. It is a real pleasure to find oneself forgetful of the passing hour as he reads this little book, and an added satisfaction upon its completion to know that one may return to any page with the assurance that its content will provide a stimulus to constructive thinking.

Years of devotion to the rebuilding and reëducating of broken minds and bodies have given Dr. Peterson a wholesome philosophy of education based on his deep and sympathetic insight into the nature of man's needs and his capacity to satisfy them. It is a practical philosophy of occupational therapy tested in the crucible of human suffering and found adequate to meet the needs of men of all ages under all conditions.

The author deplores the unintelligent waste of years of human life in preparation to "pass examinations" when these years might be used so profitably in the discovery and development of special talents and aptitudes and the inculcation of some knowledge of life's meaning, aims, and work. He quotes Dr. Abraham Flexner's statement: "The university must shelter and develop thinkers, experimenters, inventors, teachers, and students," and comments: "What leagues must be traveled to attain that splendid goal!"

Following Spencer and others, Dr. Peterson presents the fundamental educational needs in what he believes to be the order of their greatest importance, adding that they "dovetail into one another, and the complete man should have them all." Education, he says, should do the following things for us:

Educate in personal and community health
Train to earn a living
Educate in parenthood
Teach coöperation in social life, citizenship
Discover and foster special gifts and aptitudes
Insure the use of the hands
Furnish esthetic culture for our leisure

Like Victor Heiser's *An American Doctor's Odyssey*, the book is an intimate revelation of a physician's conception of service and an inspiration to all who are attempting to solve the problems of human needs.

FREDERICK W. BROWN

Live Long and Be Happy—How to Prolong Your Life and Enjoy It—*By Lewellys F. Barker, M.D. New York: Appleton-Century*, 1936. 224 pp. Price, $2.00.

The preface states that this text has been especially prepared for intelligent laymen, and also for general practitioners of medicine.

A text attempting to cover a broad field in 224 pages is necessarily somewhat sketchy. The reader gets the impression that the author has fallen

between two rather widely placed chairs. Much of the text is too technical to be of any value to the layman, and contains too many prescriptions which will tend toward self medication. This is dangerous. On the other hand, much of the material seems too general to appeal to the well educated physician.

The discussion of chronic bronchitis might well mention the fact that the "chronic bronchitis" of elderly persons is often a slowly progressing type of tuberculosis and is communicable to others. The pages on the use of drugs might well have included a warning against the habitual unsupervised use of barbitol.

The nervous and mental diseases are more fully discussed than the other topics.

For the benefit of laymen readers, a glossary would be of great value.

CHARLES H. KEENE

The Doctor and the Public— *By James Peter Warbasse, M.D. New York: Hoeber,* 1935. 572 pp. Price, $5.00.

It is fortunate that this is such a thoroughly delightful book to read, because it should be in the category of required reading for all those whose work or interest touches on the problem of medical service. It is dedicated to "the perfection of the medical art and the larger use of that art by the public." Elaborating further on its purpose, the author says, "The saving of lives is not enough. The perfecting of lives must be the aim."

The fact that the author develops his thesis historically should not deter the reader who is satiated with historical treatises, medical and otherwise. Here the historical sequence of the development of medicine serves the author as a background on which he weaves a rich pattern of philosophy, comment, and narrative. Reading Dr. Warbasse's work is to spend time in the stimulating company of a great mind. The fact that one does not always agree with the author's conclusions only lends spice to the occasion.

Interestingly the author makes the same assumption made by another recent writer in this field.* Both argue, in effect, that since it is the business of medicine to cure a sick individual, medicine is competent to cure a sick society. Similar ideas have been advanced by spokesmen for engineering, capitalism, physics, chemistry, biology, and other fields of thought including religion. Much stress is laid on the value of the medical method in solving humanity's ills; yet, on analysis, this proves to be merely the scientific method which after all may be usefully applied without limitation to any one science.

Nevertheless, Dr. Warbasse renders a profound service by stressing the importance for medical men to enlarge their social understanding if for no other reason than that they may become better doctors. One wishes that other prophets would speak similarly for other fields. He sees the patient not merely as a body but as a social being. He points out that it is an upside-down social philosophy that makes doctors the richer the sicker the race. A "preventive medicine" which gets at the ultimate roots of sickness—be they social, economic or biological—is obviously the only approach to setting this philosophy right side up.

The serious purpose of this book does not detract from its charm. It is free from dogma and has the mellowness of ripe experience. The style shows how unimportant it is for a master to adhere to the elementary rules of literary composition. Without regard to didactic rules of unity he wanders off delight-

* Sand, René. *Health and Human Progress* (Reviewed, *A.J.P.H.*, July, 1936).

fully again and again to comment on something which his main theme suggests, as when in his description of Galen he pauses to make some choice comments on doctors' bedside manners. Yet these animadversions prove to be merely a part of the wealth of incident and fact which so fully illumine his text.

There are few men who without tedious reference to many books have the knowledge to say whether the author's statements are correct. On one page he attributes the invention of the microscope to Leeuwenhoek, and 9 pages further he ascribes it to Jansen. Although such inconsistencies might irritate the meticulous student, this is not a historical source book and they do not impair its purpose or enjoyment, nor do they detract from its value as an inspiration for writers and speakers in the field of sociology and medicine.

This is a timely book yet not one that will soon be out of date. Any *system* of medical care different from the present " non-system " is quick to be condemned from some quarters as " social medicine." Dr. Warbasse points out the possibility of various systems and emphasizes the need of some system. One feels that life in the future would be happier if this book could play an important part in education of the rising generation of physicians.

The Doctor and the Public is an excellent example of bookmaking. It has a high degree of legibility but the illustrations do not do justice to the content or the printing.

HOMER N. CALVER

Why Be Tired?—*By Daniel W. Josselyn. New York: Longmans, Green,* 1936. 115 pp. Price, $1.00.

This little book in easy readable type is sub-titled " How to Make the Most of Your Energy," and is favorably comparable to a number of similar productions which have recently appeared in this field. Although the author is stated to be " a specialist in reviving fagged ' office athletes,' " and is unknown to the reviewer, he has been a careful and informed observer. The 7 chapters include Energy for Sedentary Workers, How to Do More Work Without Getting Tired, Conquering Your Fatigue Problem With Food, Improving Your Energy Machine With Exercise, Use Your Glandular Energies, Sex and Energy (a brief rational exposition), and Test Your Efficiency (an interesting summary of 42 " truisms " with questions for the reader's self-analysis).

The text is in well chosen English—stimulating, in fact, sparkling in nature, and comprised of terse, epigrammatic sentences, many similes, and much rationalization. While there is no index, the bold-face sub-headings in the chapters suffice. There is a good sprinkling of references to well known authorities. Many of the author's plausible explanations may, nevertheless, be open to question, but a pretty fair adherence to accepted thought prevails. Despite its brevity, the book is really slow reading. The author has a good knack, however, of translating scientific terms into the intelligent laymen's language, accompanied with a humorous philosophical chiding. It presents a very readable and worth while syllabus. EMERY R. HAYHURST

The Problem of Nutrition. Vol. I. Interim Report of the Mixed Committee on the Problem of Nutrition. *Geneva, 1936. League of Nations. Distributed by World Peace Foundation, 8 West 40th Street, New York, N. Y.* 98 pp. Price, $.50.

This excellent review of the established principles of human nutrition should be required reading for all health officials, physicians, and other persons who need reliable information on this important subject. Not only does this

booklet present a wealth of valuable material on dietetics and health, but it is easy to read and understand, since the style is interesting, the type good, and its physical makeup and arrangement are satisfactory.

In addition to an excellent chapter on nutrition and health, the book offers a general survey of the nutrition problem, a summary of a prior report on nutrition and labor, a discussion of the economic aspects of nutrition, and a chapter on nutrition and agriculture.

A tremendous amount of scientific information on nutrition is now available throughout the world, but much of it is not yet utilized by the people. A perusal of this valuable, but inexpensive, pamphlet will indicate both the extent and scope of " the newer knowledge of nutrition " and the manner in which it should be applied in the interests of national health programs.

JAMES A. TOBEY

Adventures in Recreation — *By Weaver Weddell Pangburn. New York: Barnes,* 1936. 138 pp. Price, $.72.

Recreation is a medium of self expression. At the best it is a zest for doing and living. It varies from the religious dances of savage tribes to the self expression in a masterpiece of art. Opportunity for recreation increases with leisure time, and this has become a mass opportunity. Schools (and universities) should train for proper use of leisure time, " A life that clicks perfectly is one that is perfectly adjusted between work, service to others, friendship, and recreation."

The author suggests the possibility that we have too much competition, that we need more coöperation. A better balance between these two should be maintained.

Mental and physical activities and recreation are practically inseparable. Recreation does not need to be expensive. Recreation interests vary with age, sex, and environment. Increasing age demands a lessening of physical activities. Effort should be made to acquire joy and skill, in some recreations at least that may be lifelong rather than transient.

Some types of recreation can be supplied only by community effort, the community must supply these. What does the community offer?

There are additional short chapters on the National Recreation Movement, Recreation as a Public Function, Municipal Recreation, and A Yardstick for Community Recreation.

Each chapter is followed by questions and projects and by a list of suggested readings.

This is a most interesting exposition of recreation, its need, aim, and the type of facility needed that all may have more abundant opportunity for true recreation and use of leisure time. The material is clearly given and usable for the adolescent age and beyond. A splendid, thought provoking, and community stirring book.

CHARLES H. KEENE

Miss Gay's Adventures in First Aid. *Series No. II—By Margaret Daly Hopkins, R.N. New York: Hopkins Chart Company, Inc.,* 1936. 47 pp. Price, $.15.

This interesting text—the second * in a series—deals with three common types of asphyxiation; gas fumes, electric shock, and water immersion.

It emphasizes the need for skilled treatment in these emergencies, especially the proper use of heat, artificial respiration, and the inhalator, and the need of medical care as soon as obtainable.

The dramatized stories add much to the effectiveness of the instructions.

CHARLES H. KEENE

* The first reviewed in this *Journal,* July, 1934.

A Synopsis of Hygiene—*By W. W. Jameson, M.D., and G. S. Parkinson. (5th ed.) London: J. & A. Churchill, Ltd.,* 1936. 623 pp. Price, $6.75.

This well known Synopsis is now in its fifth edition, evidence enough that it needs no special commendation, as the professional public has already put its seal of approval on it.

While this edition has been brought up to date scientifically, and in regard to current public health practice, the principal changes are in those sections dealing with the laws relating to public health. We are told that Parliament has recently enacted an immense amount of legislation affecting public health, including such movements as the first great consolidating Public Health Act since 1875, a new consolidating Housing Act, a Midwives Act, an amended Milk (Special Designations) Order and two consolidating measures relating to National Health Insurance and Old Age and Contributory Pensions.

Needless to say, these laws affect England especially though it is equally evident that study of the laws of a well established country like England, which has gone through the grind of establishing public health on a firm basis, is useful to all interested in public health.

The printing and make-up are good. The book can be thoroughly commended in the light of the statements made above. MAZŸCK P. RAVENEL

The Rockefeller Foundation, International Health Division, Annual Report, 1935, 286 pp.

Field and laboratory research studies on yellow fever, malaria, hookworm disease, tuberculosis, yaws, and a number of other diseases in which the Rockefeller Foundation has a special interest, are summarized in an interesting and enlightening manner in this annual report. This volume contains not only a digest of research work, but also a citation of 111 references to articles published by staff members in the medical press.

In addition to research in specific diseases, the International Health Division continues its program of aid to state and local health services, including support to governments in many countries. This support, discussed in the report, consists primarily of the installation and demonstration of improved public health methods and organization. Of considerable significance also is the support of education in public health through provision of aid to schools and other centers of training, and "particularly through an extensive program of fellowships for advanced workers in public health from whom are recruited the future leaders and teachers in this field." The volume is a useful reference text as well as a stimulating account of public health progress.

IRA V. HISCOCK

Laboratory Manual for Chemical and Bacterial Analysis of Water and Sewage—*By Frank R. Therous, M.C.E., Edward F. Eldridge, M.S., W. LeRoy Mallmann, Ph.D. (2nd ed.). New York: McGraw-Hill,* 1936. 228 pp. Price, $2.50.

The original issue of this book, containing instructions for the chemical analysis of water and sewage, has been enlarged to include similar instructions for bacteriological examination. The same method of presentation as that in the first edition has been followed—step-by-step directions, in outline form, for making those chemical and bacteriological determinations necessary for the successful operation of water and sewage treatment plants, the examination of polluted water and industrial wastes.

The book not only contains specific directions for making these tests, but

also includes methods of sampling, discussions on the elements of chemistry and bacteriology, recommendations for laboratory equipment and technic, directions for the preparation of solutions and media, and instructions on interpreting results and keeping records. Many tables and an index are provided.

The manual should be a valuable collateral text to *Standard Methods of Water Analysis* of the American Public Health Association in aiding "those whose training in chemistry and bacteriology is limited and those who need additional explanation of the procedure and technique." F. J. MAIER

History of County Health Organizations in the United States, 1908–33—*By John A. Ferrell and Pauline A. Mead, Public Health Bull. 222, March, 1936, U. S. Treasury Department, Public Health Service.* 469 pp. Price, $.50.

During the past quarter century, the county health movement has been the outstanding public health development affecting the rural population of the United States. Evolutionary steps which led to the county health movement, including activities of the U. S. Public Health Service for the control of typhoid fever, and hookworm measures instituted by the Rockefeller Sanitary Commission, are briefly described. Then follows a record of the personnel, budget, and sources of support for the 524 units in operation on December 31, 1933, and for each of the 230 additional units which were started and later discontinued. Summaries by states and by years have been made from the records of individual county organizations. Discussion is illustrated by charts to show per capita appropriations and extent of population served.

As to priority in establishing county health work, claims which have been made in behalf of Kentucky, North Carolina, and Washington are given in the appendix. "For present purposes, the fact of importance is that before the close of 1911 the county health movement was definitely born in three widely separated states, and during the next 10 year period, it spread to 186 counties in 23 states." The peak in the growth of the county service for the period covered was reached at the close of 1931 when nearly 26 million inhabitants residing in 599 counties of 36 states had the benefit of health work. At that time one-fifth of the population and one-fifth of the counties had health service. In the states thus served, a little over one-third of the population enjoyed this service in some degree.

Referring to the stability of county health organizations, the report lists the following causes of the predepression discontinuances of health units: mediocre personnel; the establishment of units before public opinion was prepared for them; inadequate leadership from state health departments, both administrative and financial; politics; and the starting of work in counties too weak to function effectively. In general, it is stated that counties with average resources which have employed reasonably competent personnel have seldom discontinued county health service.

This volume is timely and provides a valuable source book for the public health administrators and public health students of the United States. It contains a record of progress in which the U. S. Public Health Service and the Rockefeller Foundation, among other voluntary and official agencies, have played a very significant rôle. It is a valuable contribution.

IRA V. HISCOCK

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Hearing and Diseased Throats—That there existed no apparent relationship between type and degree of hearing impairment and condition of nose and tonsils as observed at the time of examination of 1,400 selected children is the finding of this study which will most interest health workers.

CIOCCO, A. Audiometric Studies on School Children. Pub. Health Rep. 51, 47:1609 (Nov. 20), 1936.

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GAFAFER, W. M. Relation of Physical Defects to Nutritional Impairment, Based on the Examination of 30,000 Children in 21 states. Am. J. M. Sci. 192, 5:669 (Nov.), 1936.

Rural Public Medical Services—In the prairie regions of Canada sparsity of population and lack of local medical practitioners have intensified the need for public medical services to be provided by the public health administrative agencies. How the needs have been met is told in this interesting symposium.

JACKSON, F. W., *et al.* Coördination of Medical Practice with Public Health in Manitoba, Saskatchewan, and Alberta. Canad. Pub. Health J. 27, 11:536 (Nov.), 1936.

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KAY, H. D. Control of the Efficiency of Pasteurized Milk: The Phosphatase Test. Canad. Pub. Health J. 27, 11:551 (Nov.), 1936.

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MURRAY, R. H. Survey of Pasteurization in Canada with a Record of Epidemics Due to Raw Milk. Canad. Pub. Health J. 27, 11:555 (Nov.), 1936.

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POYNTON, F. J. Juvenile Rheumatism. J. State Med. 44, 11:622 (Nov.), 1936.

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SMITH, M. I., *et al.* The Selenium Problem in Relation to Public Health. Pub. Health Rep. 51, 44:1496 (Oct. 30), 1936.

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person notices more than a faint odor when entering the workroom, better ventilation is needed.

SMYTH, H. F., and SMYTH, H. F., JR. Safe Practices in the Industrial Use of Carbon Tetrachloride. J.A.M.A. 107, 21:1683 (Nov. 21), 1936.

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—Sanitarians must consider the problem of rendering air free of air-borne nasopharyngeal organisms, just as they assume responsibility for freeing water supplies of intestinal organisms. Some of the preventive measures are discussed.

WELLS, W. F., and WELLS, M. W. Air-Borne Infection. J.A.M.A. 107, 22:1805 (Nov. 28), 1936.

BOOKS RECEIVED

THE PRINCIPLES OF BACTERIOLOGY AND IMMUNITY. W. W. C. Topley and G. S. Wilson. 2d ed. Baltimore: Wood, 1936. 1645 pp. Price, $12.00.

APPLIED DIETETICS. By Frances Stern. Baltimore: Williams & Wilkins, 1936. 263 pp. Price, $3.50.

MANUAL OF PUBLIC HEALTH LABORATORY PRACTICE. By J. R. Currie. Baltimore: Wood, 1936. 378 pp. Price, $6.75.

THE DEVELOPMENT OF MODERN MEDICINE. By Richard H. Shryock. Philadelphia: University of Pennsylvania Press, 1936. 442 pp. Price, $4.00.

THE TRUTH ABOUT BRIGHT'S DISEASE. By William R. Ohler. Cambridge: Harvard University Press, 1936. 80 pp. Price, $1.00.

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OVERWEIGHT. Rational Living Library. New York: Rational Living, 1936. 96 pp. Price, $.50.

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PARTNERS IN PLAY. By Mary J. Breen. New York: Barnes, 1936. 185 pp. Price, $1.00.

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A HEALTH EDUCATION WORKBOOK. By Kathleen Wilkinson Wootten. New York: Barnes, 1936. 255 pp. Price, $1.50.

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ASSOCIATION NEWS

THE POST-CONVENTION TOUR TO FLORIDA AND CUBA

THE 65th Annual Meeting of the American Public Health Association came to a close Friday afternoon, October 23, and 6 o'clock in the evening found a group of 73 persons rolling eastward out of New Orleans on the Louisville & Nashville Railroad in a special train. With the comfortable facilities provided it was not difficult to become acquainted with one's neighbors and by the end of the evening the passengers in each of the 7 cars had become mutually acquainted and we knew we were off for a good trip.

During the night the train passed through the coastal section of southern Alabama and western Florida and morning found us still on the special train, speeding over the Atlantic Coastline Railroad in sunny Florida. The forenoon provided a splendid opportunity to go over the passenger list which was distributed and made it easy to connect up names and faces so that all on the tour readily came to know each other, and we rapidly became one family party.

After a delicious luncheon on the special train, we arrived at Clearwater early in the afternoon, where we boarded three special motor coaches and started, under the guidance of Dr. James R. McEachern, the genial health officer of Tampa, for a sightseeing tour to that famous city on the Florida west coast. It was a delightful ride through the beautiful resort towns of the Pinellas peninsula, lovely St. Petersburg, and on into Tampa over the long Tampa Bay Bridge. At Tampa the officials of the Chamber of Commerce were prompt to extend the city's welcome, and the citrus fruit supplied to each traveler in his room reminded us that we were in the land of oranges. Here, too, we were met by Dr. D. A. McPhaul, the Florida State Health Officer, and our Tampa friends announced the plans for the evening.

Our buses were on hand at 7 o'clock to carry us to a unique experience at the El Pasajhe, where we were treated to a real Spanish dinner, with entertainment provided by the Federal Theatre Project. Afterward the group was delightfully entertained at the Cuban Club nextdoor where dancing and refreshments were in order. It was a point of interest that this Cuban Club was not only a social enterprise but that medical care and insurance were combined so that this club, like some of the other large clubs in cities of Spanish origin, contributed to the sense of community solidarity.

Sunday morning, October 25, found the same motor coaches waiting to carry the group around Tampa on a sightseeing trip through the business and residential sections of south Florida's commercial, financial, and industrial metropolis. After an hour's delightful ride we started on to Lakeland, where we had a delicious luncheon and were graciously received by the Chamber of Commerce. Lakeland has one of the handsomest civic centers in the South, and the setting in the midst of orange groves

was most attractive. The afternoon carried us on through Florida's famed ridge section to Lake Wales, where is located the Bok Tower and Bird Sanctuary. Only those who have seen this gem on Iron Mountain, at the highest point in Florida, can appreciate the thrill which came to the members of the party when they saw the extraordinary beauty of this marble tower with its carillon set in a tropical garden surrounded with reflecting pools.

The trip to Orlando late in the afternoon was delightful. We entered this largest city of the central part of Florida in time to see its beautiful surroundings with its many lakes and landscaped gardens. The hotel provisions in Orlando, as everywhere, were excellent, and the group was charmed with the entertainment provided by the University Club of Orlando during the evening. The local medical profession and the business men gave us an evening long to be remembered.

Starting out early Monday morning, we drove from this prosperous inland city, the financial and social center of this part of the state, through an interesting section leading directly east to the coast. Orange juice or grapefruit juice was available at frequent intervals during the day. Apparently everyone enjoyed it, for huge quantities were consumed. Through the courtesy of Dr. McPhaul a stop was made at a large orange packing plant where those who were interested had an opportunity to see how oranges are treated commercially to give them a more attractive color and to prepare them for the market. The ethylene process was demonstrated as well as the process of adding color to the skins. Not many of the group had had such an opportunity to revel in an abundance of oranges, and they evidently enjoyed the process.

Luncheon at Fort Pierce was a delightful occasion where the party enjoyed not only a welcome from the Chamber of Commerce but a most interesting account of mosquito control in that part of the world. Afternoon stops included West Palm Beach and Palm Beach, where most courteous guides showed us the outstanding points of interest in these famous resorts. Southern Florida, with its wealth of tropical vegetation and its proximity to the Gulf Stream, is a memorable place for any visitor. Even those who had seen these places many times especially enjoyed the opportunity afforded to visit a new church at Palm Beach with several remarkable works of art.

Evening with a full moon found us arriving at Ft. Lauderdale where we paused for dinner, and such a dinner it was! It was a southern style banquet in honor of the members of the tour, presented by the Mayor and the Chamber of Commerce of Ft. Lauderdale. Here many of us ate for the first time a salad made of the hearts of palms brought from the Everglades. The hospitality so generously extended included excellent musical numbers and persuasive invitations to return to Ft. Lauderdale to catch the famous tarpon. This entertainment outdoors in the tropical night was outstanding in the memories of many of those who participated. A short ride after dinner brought us to Miami where we were comfortably housed in a waterfront hotel.

There was no doubt in the minds of the visitors that Miami was appropriately known as the magic city, for it has risen so strikingly from an uninhabited sandbar within recent years. Through the courtesy of Dr. George MacDonell, the Health Officer, and his friends, we were able to see an unusually interesting part of Miami and Miami Beach and the departure of our steamer in the evening found us reluctant to leave this southern paradise.

It was a happy family party that sailed at 7 P. M. on the "Florida" of the Peninsular and Occidental Steamship Company, and many favorable comments were heard of the meals and accommodations aboard. The ship's entertainment was delightful and some of the group witnessed a never-to-be-forgotten sight of a lunar rainbow throwing its beautiful pastel colors on passing clouds as the full moon beamed down on the tropical waters of the Gulf Stream. Comments were heard that it seemed impossible for the remainder of the trip to be as enjoyable as that which had passed, but the best really was still to come.

Our arrival off the coast of Cuba early the following morning gave us a taste of the winds which make Havana such a comfortable place to live, in spite of the latitude. We had an excellent opportunity to see the approach to Havana harbor and to realize how impregnable the harbor must have been to the old warships when Morro Castle was in its prime. It still occupies a beautiful situation. Nevertheless, with all the beauty which we connect with Havana, the group soon found that the courtesy of our hosts was even more notable.

We were met as the boat docked by a group consisting of Dr. Manuel Mencia, the Secretary of Health, and Dr. Domingo F. Ramos, also of the Health Department, who then and there began a memorable demonstration of how gracious Cuban hospitality can be, indeed, and is. Not content with the ordinary provisions of special badges, freedom of the port, and convenient transportation to our hotel, the National Hotel of Cuba, these hosts had provided for every contingency, even to the extent of furnishing a competent American mother of a family who took in charge the children of the party in order that their parents could be free for the special activities of the day. It was generally agreed that our accommodations at the National Hotel in Cuba were the most luxurious that we had ever known.

Lunch was served at the Yacht Club a few miles from the city, where in surroundings of extraordinary beauty the eye rests on the colors of the Gulf Stream. All of us were made to feel at ease by our genial hosts. Representatives of the Army and the Navy, of the Department of State were on hand, and, in fact, it seemed as though everyone in Cuba was there to help make us comfortable. After a delicious lunch, various speakers briefly outlined for us the welcome which was being extended, following which the party moved on to the headquarters of the military dictator of Cuba, Colonel Battista, where we met the Colonel and many of his officers and saw the most interesting new barracks and military hospital which he has built since taking office 3 years ago.

Most of the group were interested to see the control measures for malaria along the coast being built under the direction of Dr. Henry P. Carr of the Rockefeller Foundation, who earlier in the day had shown us his fascinating laboratory at the office of the Department of Health. By means of tide gates and an elaborate drainage system, it has been possible largely to eliminate the breeding of anopheline mosquitoes in large areas, and the improvements are believed to be of a permanent variety.

Six o'clock in the evening found us at the Havana Country Club where we were guests at a most elaborate tea provided by Dr. and Mrs. Manuel Mencia. There were music and dancing out under the stars. Dinner for those who still could eat was served at the National Hotel, following which the members were free to spend the evening as they

wished. Havana was discovered to be a very colorful place at night.

As though this were not enough, our hosts arranged for us early the following morning, after any who wished had taken a plunge in the salt pool at the hotel, to visit the presidential palace where we were graciously received by His Excellency, President Gomez. The native dignity and inherent courtesy of the President impressed itself on all who attended.

Following the presidential audience, the forenoon was free for sightseeing, and our hosts provided individual automobiles for those groups who wished to see the city. The Cathedral Square is a memorable sight and is well worth a visit to Havana. For those in public health, the statues of Finlay, Reed, Agramonte, Lazear, and others were memorable and in particular, a visit which some of the group made to Las Animas Hospital, where we saw the room in which Dr. Reed was voluntarily infected with experimental yellow fever, as well as the room where one of the nurses among the volunteers gave up her life in the effort to make clear the cause of this devastating disease.

One of the outstanding features of the entire visit to Havana was a lunch served at the National Hotel on Thursday noon, where we were again the guests of Dr. and Mrs. Mencia. Our speakers found difficulty in saying adequately what all of the party sincerely felt with respect to the wonderful hospitality which had been shown. After the sightseeing of the afternoon, our boat returned, leaving Havana in the evening. Many of those present had learned a new lesson in what could be done with gracious hospitality, and many of us will never be the same as a result of what we there experienced.

Arrival in Miami the following morning was followed shortly by the departure of our special cars in the train of the Atlantic Coast Line Railroad. We arrived in Jacksonville in the evening and bid farewell to Dr. and Mrs. McPhaul, who added so much to the pleasure of the trip by accompanying us. At Jacksonville, the party broke up into those going west and north and the following morning found the groups divided in fact but still under the spell of a remarkable experience. It was commonly said that if the Association ever found it possible to excel the quality of this trip to Cuba, it would be a remarkable achievement. Fortunately the entire tour was completed without accident and with the general feeling of satisfaction that it had contributed not only to pleasure but to a better understanding of the problems of our southern states and of Cuba, and to the promotion of international comity.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

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Valentine A. Gudex, M.D., 2969 North Booth, Milwaukee, Wis., Deputy State Health Officer

Dr. Laurie J. Jarvinen, Turku, Finland, City Health Officer

Ransom J. Jones, M.D., Poplarville, Miss., Pearl River County Health Officer

Edward L. McIntosh, Box 182, Camden, Ala., Wilcox County Health Officer

Elmo R. Zumwalt, M.D., P. O. Box 668, Tulare, Calif., Tulare County Health Officer

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Ruth E. Skemp, Clayton, Mich., Student

Frances L. Syrett, Caddo-Shreveport Health Unit, Shreveport, La., Chief Nurse

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Chester A. Hicks, M.D., 323 Packard St., Ann Arbor, Mich., Student

Eleanor M. Mellen, Veterans' Administration Facility, Des Moines, Ia., Senior Recreational Aide

Gladys O'Bryant, City Bldg., Wichita, Kans., Director of Laboratory, City Health Dept.

Spencer D. Whiting, M.D., Colorado River Agency Hospital, Parker, Ariz., Agency Physician

STANDARD METHODS FOR THE EXAMINATION OF WATER AND SEWAGE

Eighth Edition

USERS of this text will please make the following corrections in all copies of the first printing:

1. On p. 1 in paragraph 3, change "Parts III and VI" to read "Parts III and IV."
2. On p. 37 in Sec. 1, 1.4, the last line should read "1 ml. is equivalent to 0.05 mg. of fluorine."
3. On p. 75 under 2.2 in last line, change "6N hydrochloric acid" to read "3N hydrochloric acid."
4. On p. 86 under 1.3 change the second sentence to read "To this add 140 g. of C. P. ammonium chloride and 350 ml. of C. P. ammonium hydroxide (sp. gr. 0.90)."
5. On p. 140, in Fig. 5, the drawing of the cross-section of the sampler is in error. The edge of the lid should be shown flush with the outside of the sampler, *i.e.*, 6½" in diameter.
6. On p. 177 in line 5 of Section 4, delete "200" and insert "20."
7. On p. 203 in line 7, delete "0.05" and insert "0.5."
8. On p. 204, in line 7, Sec. L., delete "95" and insert "85 to 90."
9. On p. 261, in line 2 under Section F, the word "selective" should be substituted for the word "specific."
10. On p. 264, f. 4, should read "Certified by the Biological Stain Commission (Cert. No. CBg-3 (Coleman & Bell Co.) *or equivalent*), etc.
11. On p. 286 under Option 2. first sentence should read "Into clean wet bottles add approximately *0.02* to 0.05 g," etc.

The first printing of the Eighth Edition is nearly exhausted. An earnest appeal is made that any errors not listed above be reported promptly so that all corrections may be made before the second printing.

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Address comments to:
American Public Health Association
50 West 50th Street
New York, N. Y.

NEWS FROM THE FIELD

THE NATIONAL HEALTH SERIES

A NEW National Health Series of 20 books dealing with various aspects of personal and community health will appear during January. The original National Health Series, first published in 1922, has been completely revised; some titles have been retained; some have been omitted; and a number of new titles have been added.

All of the books of the old Series that have been retained have been completely rewritten. Obtainable from the American Public Health Association Book Service.

HEART ASSOCIATION LECTURES

THE New York Heart Association announces a series of lectures on heart diseases, endorsed by the New York Academy of Medicine, for the practising physician. These are to be held at Mount Sinai Hospital, New York Academy of Medicine, Cornell Medical College, and Bellevue Hospital, on alternate Tuesdays from January 12 to April 27.

WORLD HEALTH ACTIVITIES

THE Health Section of the World Federation of Education Associations, through its chairman, Professor Clair E. Turner,* cordially invites the members of the American Public Health Association to participate in the meetings of the Seventh Biennial Conference to be held in Tokyo, Japan, August 2–7, 1937. The subjects to be discussed are Health Education, Health Services, and Physical Education.

Details regarding the program can be secured by addressing the Secretary, Sally Lucas Jean,* 200 Fifth Avenue, New York, N. Y.

INTERSTATE REGISTRATION PROBLEMS CONFERENCE

THE Conference on Interstate Registration Problems was held in Baltimore, Md., on November 17. The purpose of the meeting was to promote coöperation toward solving certain interstate problems of registration.

A. W. Hedrich, Sc.D.,* presided.

PROTECTION OF INFANCY CONGRESS

FOLLOWING the deliberation taken by the Assembly of the official delegates of the 38 governments attending the First Congress, held in Paris in 1933, the Second International Congress for the Protection of Infancy will be held in Rome.

The definitive date, approved by the Italian Government, is fixed for October 4–8, 1937, after the Fourth International Pediatric Congress which will take place in Rome September 24–30, in the period of the bimillinarian celebration of the Emperor Caesar Augustus.

GOITER PRIZE

THE American Association for the Study of Goiter again announces a competition for the Van Meter prize of $300 and two honorable mentions for the best essays submitted describing experimental and clinical investigations of the thyroid gland.

The award will be made at the annual meeting of the association in Detroit, June 14–16, 1937. Manuscripts, in English and typewritten double spaced, should be sent to the secretary, Dr. W. Blair Mosser, 133 Biddle Street, Kane, Pa.

* Fellow A.P.H.A.

HOSPITAL INSURANCE STUDY

A GIFT of $100,000 to the American Hospital Association for the study and development of voluntary hospital insurance was announced by Edwin R. Embree, president of the Julius Rosenwald Fund, at the annual meeting of the Fund recently held in Chicago. This plan, known as group hospitalization, enables persons of moderate means to secure hospital care by payments of from $6 to $12 per year without recourse to charity.

The program of the American Hospital Association will be carried forward through a special Committee on Hospital Service, of which C. Rufus Rorem, of Chicago, becomes Executive Director.

LABORATORY OF INDUSTRIAL HYGIENE

THE Laboratory of Industrial Hygiene, in New York City, has been incorporated under the laws of the State of New York as a non-profit organization empowered to carry on scientific and industrial work in chemical, bacteriological, and, in general, public health problems, to accept grants for definite scientific purposes, etc. Its officers include William Hallock Park, M.D.,* *President;* Grace McGuire, *Secretary;* and K. George Falk, Ph.D.,† *Vice-President and Treasurer.* Its staff includes Grace McGuire, in charge of chemical work, Eugenia Valentine Colwell, in charge of bacteriological work, Dr. K. George Falk, Director, Dr. William Hallock Park, Consultant, and a number of assistants.

The laboratory includes at the present time the following units: (1) Certified Milk Laboratory under the direct supervision of Dr. Park, (2) Vitamin Testing Laboratory, (3) Clinical Diagnostic Laboratory, (4) Chemical Laboratory and (5) Bacteriological Laboratory.

* Fellow A.P.H.A.
† Member A.P.H.A.

WYOMING DIVISION LAUNCHED

WYOMING has recently established a Division of Sanitary Engineering in its Department of Public Health, for the development and improvement of municipal water supplies and sewage disposal systems.

MICHIGAN DEPARTMENT OF HEALTH ELECTS NEW OFFICERS

NEW officers of the Michigan Public Health Association were elected at their annual meeting, held in Lansing, November 11–13, as follows:

President, J. D. Brook, M.D.,† Grand Rapids

Vice-President, Frank A. Poole, M.D.,† Saginaw

Secretary-Treasurer, Marjorie Delavan,* Lansing

Representative on the Governing Council, A.P.H.A., C. C. Slemons, M.D.,* Lansing

NEW JERSEY HEALTH AND SANITARY ASSOCIATION

THE 62nd Annual Meeting of the New Jersey Health and Sanitary Association in coöperation with the New Jersey Health Officers Association, the New Jersey Congress of Parents and Teachers, and the New Brunswick Health Council was held in New Brunswick, N. J., November 20–21. The program was developed around three topics—industrial hygiene, communicable disease and child health, and these were discussed by outstanding figures, including G. H. Gehrmann, M.D., of Wilmington, Del., Albert S. Gray, M.D., of Hartford, Conn., J. J. Bloomfield of the U. S. Public Health Service, Aims C. McGuinness, M.D., of the Children's Hospital, Philadelphia, in addition to local speakers.

A feature of the evening session was a review of unofficial public health work in New Jersey presented by representatives of the State Medical Society, the State Dental Society, the State Organization for Public Health Nursing, the

Tuberculosis League, the Congress of Parents and Teachers and the Conference of Social Work. This was summarized and commented upon at the conclusion by Dr. Henry F. Vaughan, Commissioner of Health of Detroit.

New officers of the New Jersey Health and Sanitary Association were elected as follows:

President—Jacob G. Lipman, Ph.D.,* New Brunswick
First Vice-President—William H. MacDonald, M.D.,† Trenton
Second Vice-President—Joseph R. Morrow, M.D., Ridgewood
Third Vice-President—L. D. Bristol, M.D., Montclair
Secretary—Edward Guion, M.D.,* Northfield
Treasurer—Budd H. Obert,* Asbury Park
Executive Secretary—John Hall,* Freehold

PERSONALS

DR. JOHN J. POUTAS, of Newton, Mass., Assistant Director of Communicable Diseases in the Massachusetts State Department of Health since 1934, has been appointed Health Officer for the Connecticut River Valley District, to succeed the late Dr. Harold E. Miner,† of Holyoke.

DR. SAMUEL W. HAMILTON, of White Plains, N. Y., Assistant Medical Director of the New York Hospital, Westchester Division, has resigned to become Director of a hospital survey for the National Committee for Mental Hygiene.

DR. HENRY D. REID, Federal Quarantine Officer at Partridge Island, St. John, N. B., succeeds Dr. Stewart S. Skinner, who has retired as Chief Medical Officer of the Lancaster Hospital, St. John, under the Department of Pensions and National Health.

DR. JOSEPH S. SPOTO, of Tampa, Fla., has been appointed Director of the Hillsborough County Health Unit.

DR. CARLTON K. HEADY has been appointed Town Health Officer of Milford, Conn.

DR. JOHN WARREN BELL, of Olean, N. Y., has been appointed Director of a new division of maternal and child health in the Nebraska State Department of Health set up under the social security plan.

DR. HOMER P. BASINGER has been appointed Health Officer of Windom, Minn., succeeding Dr. Albert L. Pertl, resigned.

DR. LLEWELLYN R. COLE, Assistant Physician in the Department of Student Health at the University of Wisconsin, Madison, has been appointed Director, to succeed Dr. Charles E. Lyght, who has been made Director of Health at Carleton College, Northfield, Minn.

DR. THOMAS C. HODGSON has been named Health Officer of Berlin, Conn., to fill the unexpired term of Dr. Matthew H. Griswold.†

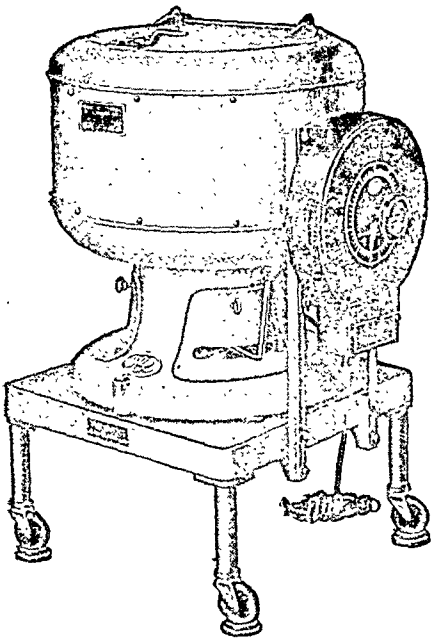
FRANCIS B. CARROLL, M.D., C.P.H.,† of Battle Creek, Mich., has been appointed Health Officer of Van Buren County.

TRAVIS P. BURROUGHS, M.D.,† Sanitary Officer of Concord, N. H., was appointed, on December 8, Secretary of the New Hampshire State Board of Health, to succeed Charles Duncan, M.D.,* deceased. Dr. Burroughs, who for several years has been city Health Officer of Concord, was formerly Deputy Commissioner of Health in the Cattaraugus County Department of Health, Olean, N. Y.

DR. C. H. WATSON, of New York, Medical Director of the American Telephone & Telegraph Co., was honored by reëlection to the presidency of the National Safety Council, at the Twenty-fifth National Safety Congress held in Atlantic City, N. J., Oct. 5–9.

DR. CECIL J. VAUGHN,† of Lexington,

* Fellow A.P.H.A.
† Member A.P.H.A.



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Standard Methods for Examination of Water and Sewage, 8th ed. (American Public Health Association)	2.50
Control of Communicable Diseases, rev. ed. (American Public Health Association)	.30
Preventive Medicine and Hygiene—Milton J. Rosenau, M.D. 6th ed.	10.00

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The American Public Health Association is the technical society of professional public health workers. It is not endowed. It derives its income from membership fees, its publications and business services, and from grants for special purposes.

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I give and bequeath to the American Public Health Association, a corporation organized under the laws of Massachusetts, the sum of
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Positions Wanted

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Physician, M.D. Medical College of Virginia; 3 years in the Medical Corps, U. S. Navy; city health officer for 16 years; desires position as health officer. Eastern city preferred. A-274

Physician, M.D. Hahnemann Medical College; special course in public health at University of North Carolina; wishes position as county health officer in the Northeastern area. Served as school physician of a small township for 7 years. Available at once. A-275

Physician, M.D. University of Wisconsin; M.P.H. Harvard School of Public Health; special courses in industrial hygiene; available now for an administrative position or one in industrial hygiene. A-279

Physician, M.D. Western Reserve University; 3 months' Health Officers' course at Johns Hopkins; 1 year's experience as instructor of Hygiene and Bacteriology; 4 months as county health officer; desires position as health officer or in the field of research. A-273

M.D. desires position as health officer. Has been city and school physician for four years. A-280

PUBLIC HEALTH ENGINEER

Public Health Engineer, Graduate of M.I.T. with B.S. in Public Health Engineering, desires position. Has served as assistant county and state sanitary engineer, and as assistant areal supervisor of occupational morbidity and mortality study, Office of Industrial Hygiene and Sanitation, U.S.P.H.S. A-283

LABORATORY

Young man, M.S. in Bacteriology, University of Colorado, desires position in a health department laboratory or in the teaching field. Experience covers laboratory work in a state health department, graduate assistant in the department of bacteriology and public health of a university school of medicine, and bacteriologist and chemist of a city health department. West preferred. L-276

Young woman, B.S. University of Chicago, desires position in the field of bacteriology or parasitology. Has been employed as first assistant and research fellow in the department of bacteriology, parasitology and serology of a Chicago hospital, head of a private clinical laboratry, supervisor of a unit for survey of food handlers for carriers of E. histolytica under Chicago Board of Health, bacteriologist in a health department and in a tuberculosis sanitarium. L-277

Technician. Position with specialist or group by man having both clinical and laboratory experience with G.U. cases and syphilis. Competent Serologist. Thirteen years' full-time laboratory, all routines. Trained New York Postgraduate, St. Luke's and Massachusetts General. L-278

Young woman, B.S. Tufts College; M.S. University of Illinois; Ph.D. Western Reserve University; 4 years' experience as director of a city health department laboratory and several years' experience in both commercial and hospital laboratories; desires position doing research or routine in chemistry, bio-chemistry, bacteriology or serology in public health laboratory. L-272

Gentleman, with Bachelor of Bacteriology degree, Medical courses at University of Maryland for 4 years, wishes position as bacteriologist with chance to do investigation work, laboratory director or instructor in science and public health. L-281

Young woman, A.B. Barnard College, special courses at Delamar Institute of Public Health, Columbia University, at present Medical student at New York University, wishes part-time work in statistics or in a laboratory. L-282

Technician, young man, graduate Brooklyn College; extensive experience in laboratory medicine, blood chemistry, bacteriology; several publications in serology; former research worker in Grade A medical school; special work in Darkfields; desires position as medical technician or research worker. L-218

MISCELLANEOUS

Physician, M.D., Medico Chirurgical, Philadelphia, 4 years Army Medical Corps, 10 years full time County Health Officer, 5 years' field experience in syphilis control, desires position as Venereal Disease Control Officer in a state or municipality which is seriously interested in the control of syphilis. M-284

Young woman, experienced statistical worker with background of newspaper work, desires position. S-285

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CONSERVATION OF ESSENTIAL ELEMENTS IN PROTECTIVE FOODS

I. MINERALS

● Considerable differences may exist between the mineral contents of foods from both the qualitative and quantitative standpoints. In fact, variation in mineral content has been noted even in the same plant variety; such variations being dependent, among other factors, upon soil or climatic conditions (1).

A striking example of the influence of one of these factors is the relative richness in iodine of field crops raised in certain coastal regions of this country where the soil is also high in iodine.

From the point of view of those concerned with human nutrition, interest in the mineral content of the food supply is usually centered around calcium, iron and iodine; since it is generally agreed that of all the essential minerals, these are the ones most apt to be inadequately supplied by the average varied diet. Conservation of these minerals in foods is, therefore, a matter of considerable practical interest.

Unlike the vitamins, minerals are not lost during storage of fruits and vegetables. However, solution losses during cooking may be severe, due to the fact that most minerals, as they occur in the plant, are soluble, or at least are extractable, by the water in which they are cooked. For example, cabbage cooked by the usual home method has been shown to lose from 21 to 72 per cent of its calcium (2).

As exemplified by these studies, solution losses of minerals in leafy vegetables are usually high. Losses in vegetables as a class are not, however, so excessive, as indicated by an average reported loss of 19.5 per cent of the calcium in seven common vegetables (3).

The average decrease during cooking in the ash content of five common vegetables has been found to approximate 37 per cent (4).

While the extent of mineral loss during ordinary home cooking methods will vary with the particular element under consideration as well as the food in which it is contained, sufficient evidence is at hand to indicate that such losses may be considerable. It is further apparent that discarding the cooking water—the usual home practice—entails a loss of valuable, essential mineral components of food.

Modern practice in commercial canning goes far in preventing these solution losses of minerals. Canned foods are cooked by the heat process accorded them while still contained within the hermetically sealed can. A minimum of water is used which also remains within the can, conserving for the consumer's use those extractable essential mineral elements which may be lost to the cooking water during home preparation of market varieties of foods.

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(1) 1936 J. Nutrition 11, 55
(2) 1936 J. Home Econ. 28, 18
1925 Ibid, 17, 265
(3) 1935 J. Home Econ. 27, 376
(4) 1917 Amer. J. Dis. Child, 14, 34

This is the twentieth in a series of monthly articles, which will summarize, for your convenience, the conclusions about canned foods which authorities in nutritional research have reached. We want to make this series valuable to you, and so we ask your help. Will you tell us on a post card addressed to the American Can Company, New York, N. Y., what phases of canned foods knowledge are of greatest interest to you? Your suggestions will determine the subject matter of future articles.



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By HUGH S. JOHNSON.

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The three newspaper headings reproduced above are in recognition of Surgeon General Parran's efforts to stamp out social diseases.

Two of them are from the New York Herald Tribune of December 28th and 30th, 1936, and the third heading appeared in the New York World-Telegram of December 26th, 1936, over a powerful article by General Hugh S. Johnson.

We should like also to extend our hearty congratulations to Dr. Parran for his courage in calling a conference of such outstanding minds and proved abilities to bring out in the open a subject that has always been regarded as "not nice" and "not to be discussed" and do something about it.

Cancer and tuberculosis were brought out in the open and the public mind was made conscious of them and the death toll they exacted and great progress has been made in their cure, control and eventual eradication.

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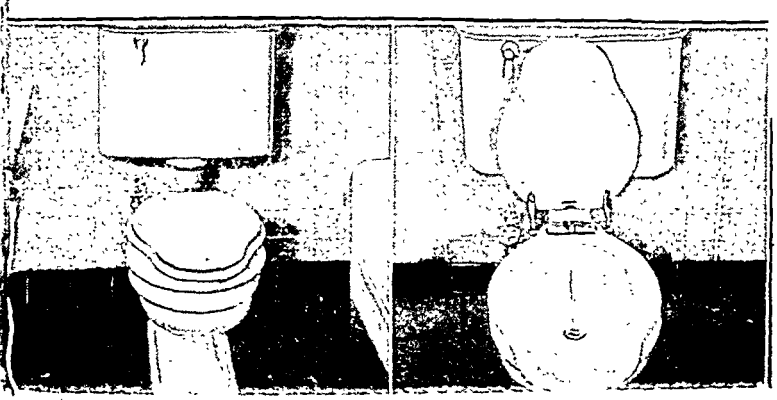
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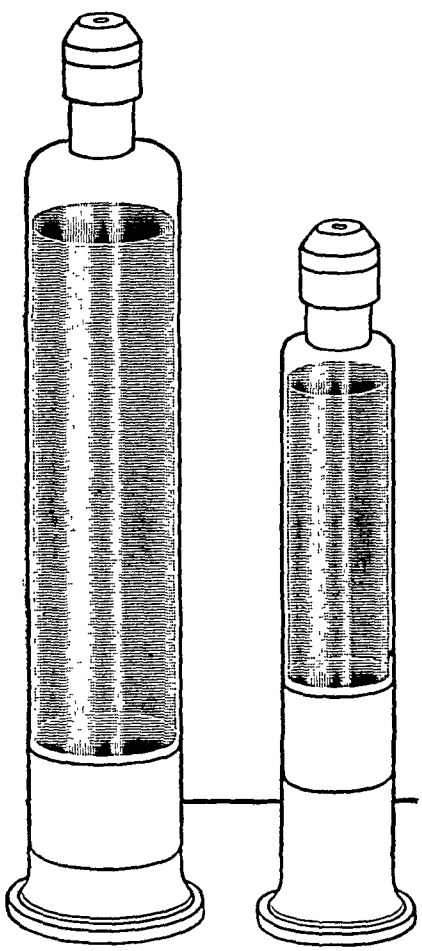
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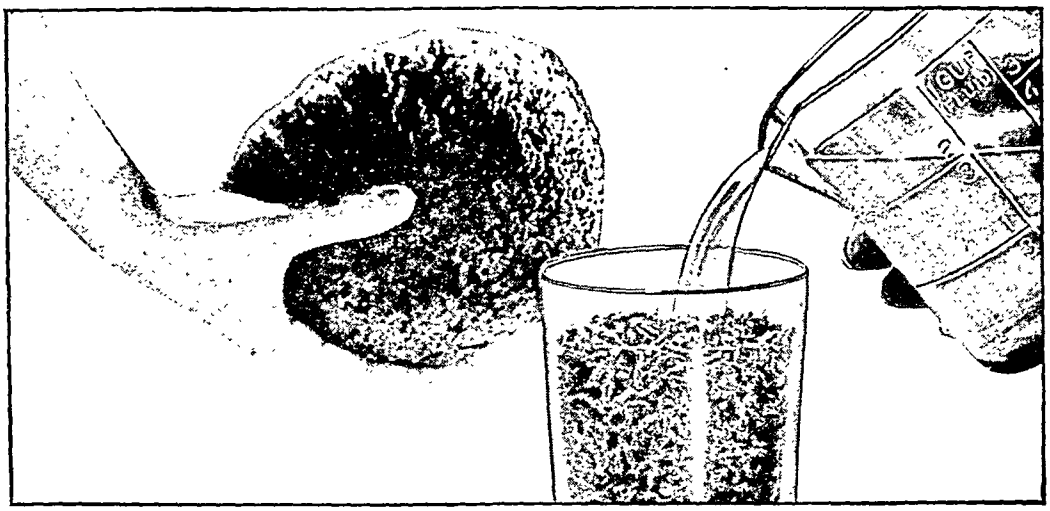
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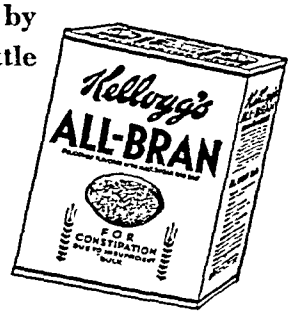
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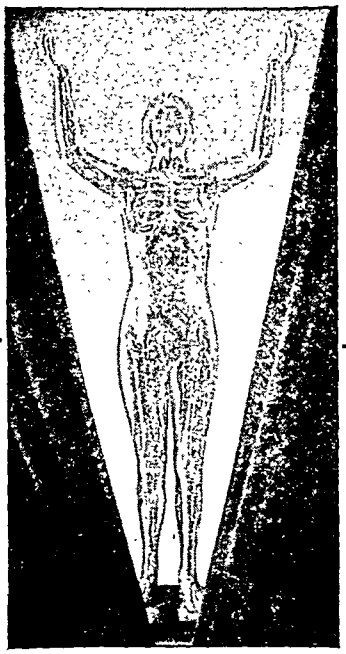
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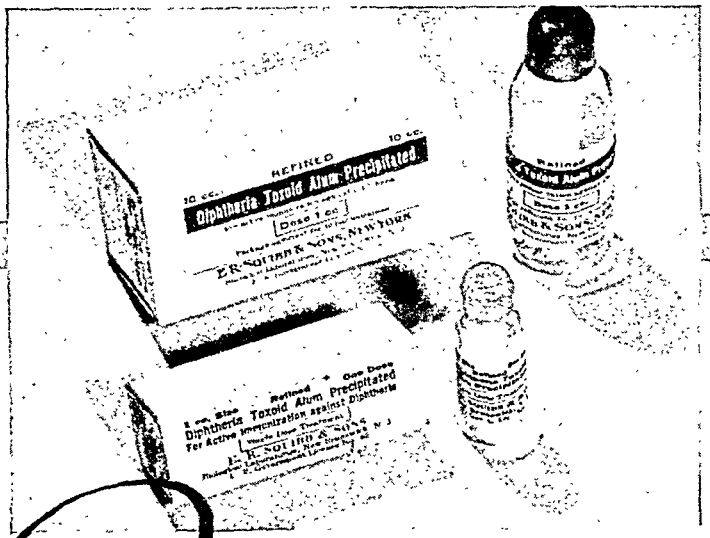
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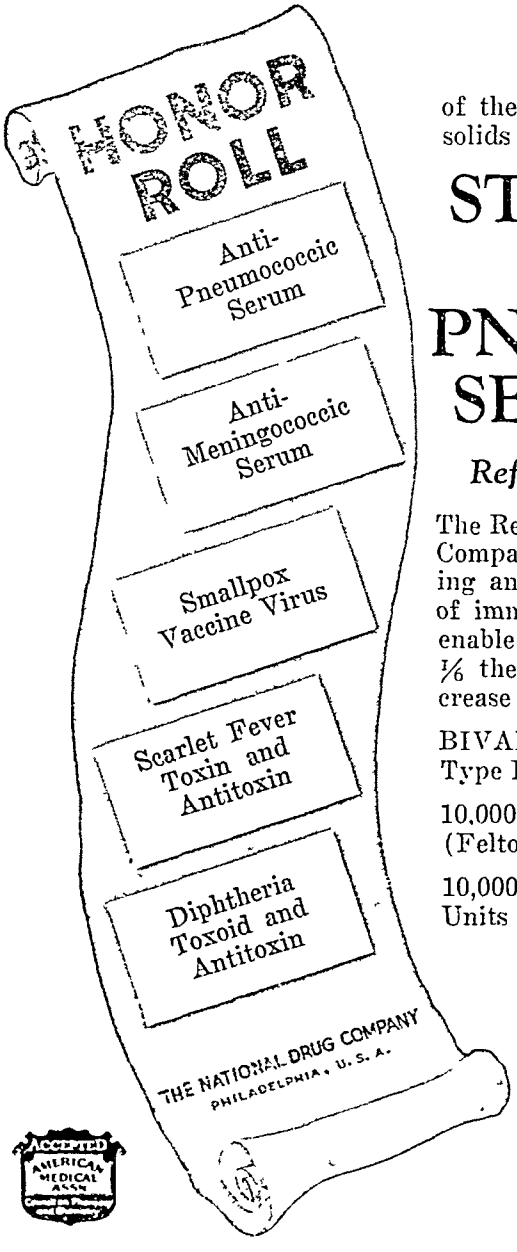
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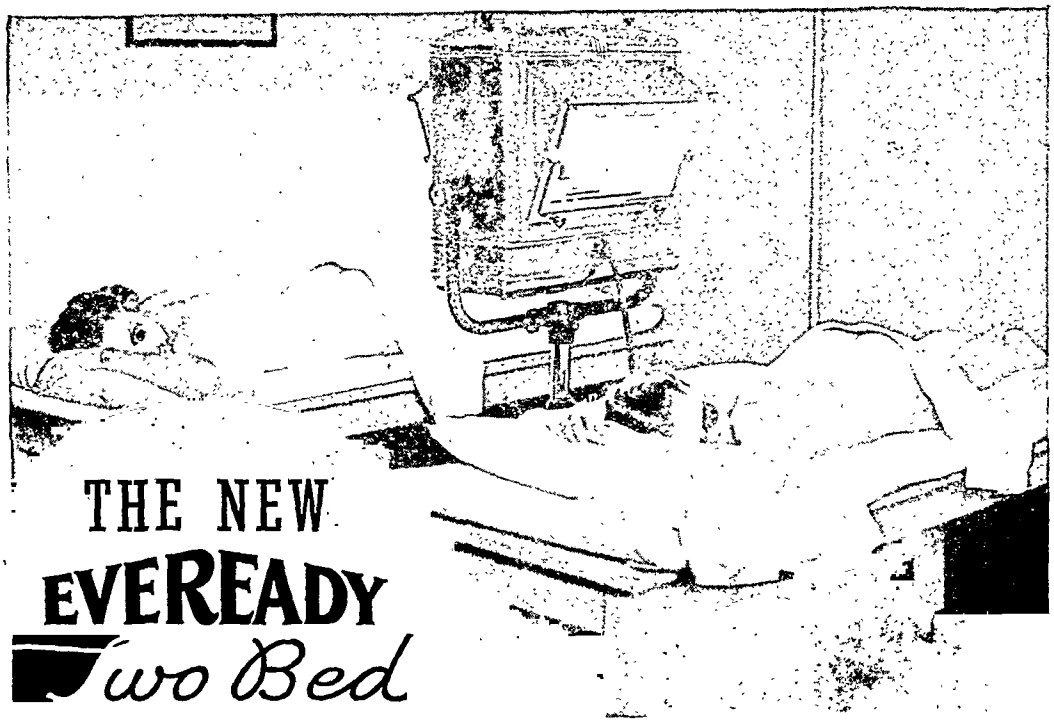
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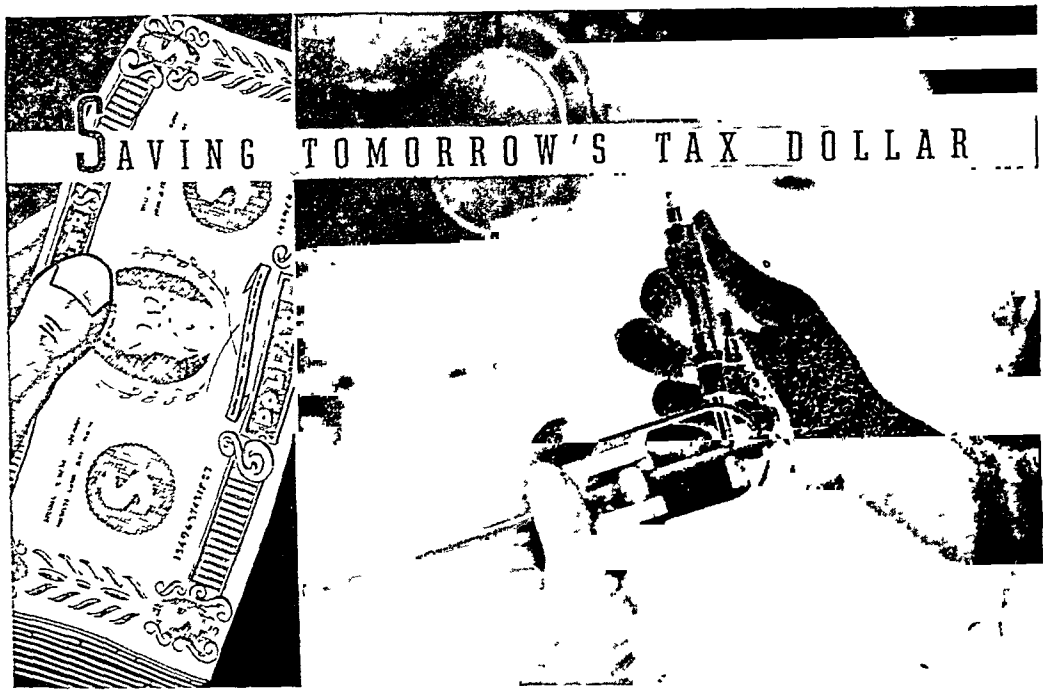
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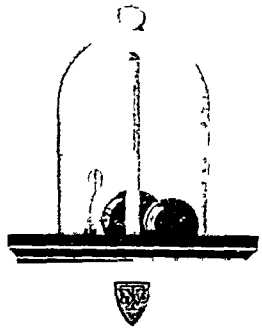
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Experience With the Picric Acid-Alum Spray in the Prevention of Poliomyelitis in Alabama, 1936*

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THE nasal membrane, as originally demonstrated by Leiner and Von Wiesner,[1] 1910, affords a portal of entry for the production of experimental poliomyelitis in monkeys, the virus being able to pass the non-irritated membrane as shown by Levaditi and Danulesco,[2] 1912.

Schultz and Gebhard,[3] 1934, Brodie and Elvidge,[4] 1934, and Lennette and Hudson,[5] 1935, have shown that severance of the olfactory nerve prevents experimental poliomyelitis following intranasal, and even intravenous inoculations with the virus.[5] These observations, therefore, point to the olfactory nerve as being the avenue by which infection travels from the nasal cavity, or even from the blood stream, to the central nervous system.

Armstrong and Harrison[6] first demonstrated that various chemicals, notably alum, picric acid, or a mixture of the two, when instilled into the nostrils of monkeys tended to prevent central nervous system involvement following subsequent introduction of poliomyelitis virus by the same route, or even into the blood stream.[7]

Prior to this work, Olitsky and Cox[8] had shown that 1 per cent tannic acid instilled into the nostrils of mice 3 times daily for 3 successive days, tended to protect mice against intranasal inoculation with the virus of equine encephalomyelitis, but was ineffective in attempts to protect guinea pigs similarly against the same virus. Armstrong[9] likewise demonstrated that various solutions instilled into the nares of mice tended to protect them against the virus of encephalitis (St. Louis type) administered by the same route. More than 150 solutions have been tested against this virus on mice, this economical set-up being utilized as an indicator for the selection of chemicals suitable for trials on monkeys against poliomyelitis virus.

In our hands the most effective agent

* Read before the Southern Branch, American Public Health Association at the Fifth Annual Meeting in Baltimore, Md., November 17, 1936.

so far found is a mixture containing 0.5 per cent each of picric acid and sodium aluminum sulphate in 0.85 per cent saline. The results secured by Armstrong and Harrison with alum and with picric acid have been confirmed by Sabin, Olitsky, and Cox[10] and by Schultz and Gebhardt.[11] These workers also demonstrated that other chemicals such as tannic acid,[10] and mercurochrome,[11, 13] were also effective.

INFECTION IN MAN

The observations of Leake[12] afford direct evidence that infection of the central nervous system in man is also by way of nerve tracts, for in those cases suspected of developing from a subcutaneous infection of virus, paralysis, when it occurred, appeared first at the cord level which supplied nerves to the inoculation site. Such a correlation would scarcely have occurred had infection progressed by other than the axonal route.

The recovery of the virus from the nostrils of man, the anatomical arrangement of the olfactory terminals, epidemiological considerations, and the limited value of immune serum in preventing natural infection, point to the olfactory nerve as the probable usual portal of entry for poliomyelitis in man.

EXPERIMENTAL RESULTS

Through the instillation of the picric-alum solution into the nostrils, Dr. Harrison and I have saved 24 of 25 monkeys from an intranasal instillation of virus which proved lethal for 20 of 26 similarly inoculated controls. The solution produced no demonstrable local effect when instilled repeatedly into the nostrils or eyes of monkeys; neither were demonstrable effects noted in the kidneys or other organs.

The solution was sprayed repeatedly into our own nostrils and a small group of volunteers without apparent ill effects.

FIELD TRIALS ON MAN

In the absence of any established practical method for preventing human infection with poliomyelitis, it seemed that the experimental evidence justified a trial of the method in man. The appearance of poliomyelitis in Alabama in 1936 afforded an opportunity to carry out such a field trial. Following a conference between state and federal health administrators, it was decided to offer the method for application in the infected area.

The State Health Department, therefore, supplied each physician in Alabama with a résumé of the experimental work carried out to that time, including instructions as to the preparation and application of the solutions.

It was made clear that the evidence as to the protective action of the proposed spray was based entirely upon animal experimentation and was not to be considered of proven value in the prevention of poliomyelitis in man. The Surgeon General of the U. S. Public Health Service, moreover, detailed a medical officer to the infected area who was familiar with the details of the experimental work. This officer, through a series of well attended meetings with physicians, the first of which was held in Montgomery on July 15, 1936, fully acquainted the profession with the theoretical and experimental basis for the proposed method.

It was advised that the proposed remedy be administered either by a physician or under his immediate supervision, for the following reasons:

1. The proposed spray had not been administered to any large group of individuals and it was desirable that its application be closely observed for untoward effects and that any such effects be promptly reported.

2. It was felt that a physician acquainted with the rationale of the method would be better qualified to apply it adequately than would a sympathetic parent who was probably unacquainted with the anatomy of the nasal cavities or of the region to be covered.

3. It was desirable that records of all treatments be kept, and a form for this purpose was made available to physicians.

ADVISED METHOD OF APPLICATION

Realizing that thorough application of the solution to the olfactory area was fundamental for the success of the method, a grant was made in March, 1936, by the President's Birthday Poliomyelitis Committee to Dr. Max Peet of the University of Michigan for determining the best method of its application in children. Dr. Peet and his associates began their studies on monkeys and demonstrated by means of X-ray opaque substances that the spray from an atomizer apparently coated the monkey's nasal vault as completely as did our experimental method of flooding. Schultz and Gebhardt,[13] moreover, demonstrated that atomizer applied solutions tend actually to prevent intranasal infection of monkeys. Dr. Peet's work indicated that the position of the head during spraying made no apparent difference in monkeys, and it was his feeling that the nasal vault in children would be easier to reach with a spray than was the case in animals. Actual tests on children were, however, delayed by illness and other unavoidable circumstances, so that specific information based upon actual trials in children was not available when field tests were undertaken in July, 1936, and are not now available.

Our advice to physicians, based on the animal work, was that 3 or 4 puffs from an atomizer, directed toward the top and not the back of the head, be administered up each nostril, and that the position of the head probably made no great difference. Spraying every other day for a week and once weekly thereafter for the duration of the poliomyelitis season was recommended. This schedule was based upon the fact that an accumulative protection was demonstrated with successive spraying in animals and that, once established, less frequent applications would maintain it. Crowding of children into the physician's office was considered to be objectionable by the State Health Department; so, where possible, spraying in the open was advocated. The public was advised through the lay press as to the aims and hopes of the spray.

ACTUAL METHOD OF ADMINISTRATION

Some few physicians preferred not to employ an experimental procedure, and others feeling that the parents could be taught to do the spraying demonstrated the procedure and advised them to purchase materials and to spray their own families.

The great mass of physicians stood squarely behind the efforts of the Health Departments; but it soon became evident, largely through the activity of the people themselves, that what we had hoped would be a test by and under the profession, had become a test by the masses, largely uninstructed; upon the masses, with all the many variations of method which such a procedure implies. The same thing happened in Tennessee and Mississippi, where spraying was also instituted. In a surveyed area, only 57 from 1,153 families were regularly sprayed by physicians.

NUMBER OF PEOPLE SPRAYED

Birmingham and the surrounding county of Jefferson, Ala., were selected as the most suitable location in which to study the effects of the chemicals. In order to determine the extent to which the spray had been used, a house-to-house survey was carried out in 20 representative districts of the city, and in 7 of the county. The canvass was made by a group of lay inspectors who had had previous experience in health department surveys. Each household in the 20 city areas and the most available

ones in the 7 county areas were visited and a record of the pertinent facts secured for each inmate. A total of 2,076 families comprised of 8,093 inmates were thus canvassed, of whom 5,010, or 61.9 per cent were sprayed at some time between July 15 and August 22. From a total of 5,097 white people there were 3,545, or 69.7 per cent, who had sprayed. while of 2,996 colored people 1,465, or 48.9 per cent, had employed the chemicals. Assuming the same rate of spraying for the whole area as obtained in the districts surveyed, it appears that we are dealing with sprayed and not sprayed groups of approximately 270,000 and 160,000 individuals, respectively. By reference to Tables II and III it may be noted that the very young and the older adults sprayed less than the more susceptible age group.

UNTOWARD RESULTS

Records as to the effects of the chemicals were secured from 4,631 individuals in the Birmingham area who had sprayed from 1 to 8 or more times. In 3,758 of these there was no complaint, while 885, or 20.8 per cent of those reporting, complained of uncomfortable but not serious conditions, such as headache for from 1 to 36 hours; nausea, usually after the first or second applications; temporary burning of the nose; head colds, irritation of the nose or eyes (Table I). There were no instances of suspected idiosyncrasy to the chemicals encountered among the population of the surveyed areas. However, through requests made to physicians to report any serious results believed attributable to the spray, we have learned of 7 instances located in Alabama, Tennessee, and Mississippi of what appears to have been idiosyncrasy, probably to the picric acid. In 5 of these cases the chief complaint was a rather severe local irritation of the nostrils followed by urticaria. Two cases reported by Dr. L. J. Rutledge of Mississippi are said to have developed acute nephritis, with hematuria and general anasarca, one after 2 and one after 4 applications at school. Both recovered and after a month were found apparently well. These cases occurred among a total of probably 2,000,000 persons sprayed in the 3 states. Other instances of hypersensitivity may have developed, but they were not brought to our attention. It is moreover probable that more unpleasant consequences would have developed had the spraying been more uniformly thorough.

TABLE I

NUMBER AND NATURE OF COMPLAINTS FOLLOWING EMPLOYMENT OF PICRIC ACID-ALUM SPRAY, BIRMINGHAM AND JEFFERSON CO., ALA., SURVEYED DISTRICTS

Headache—1 to 36 hours' duration	242
Nausea—usually after first or second spray only	149
Burning of nose—temporary	140
Headcold	139*
Irritation of throat	100
Irritation of nose	89
Irritation of eyes	9
Nose bleed	8
Earache	3
Aggravated sinusitis	3
Nervousness	1
Aching all over	1
Fever	1
Effects not stated	379
No complaints	3,768
* "Cured their cold" 8	
Total persons supplying data	4,631

DIAGNOSIS OF POLIOMYELITIS IN THE BIRMINGHAM AREA

There is no contagious disease hospital in Alabama. Cases were largely treated in the homes, no written histories or charts were available, and but few spinal taps were performed. It was therefore deemed advisable to confine our calculations to paralytic cases of which 67 were reported from the Birmingham area June 6 to September 26.

TABLE II

CASES OF POLIOMYELITIS IN WHITE PERSONS, BIRMINGHAM AND JEFFERSON CO., ALABAMA, BY SPRAYED AND NON-SPRAYED GROUPS, AND BY AGE PERIODS, AND THEORETICAL NUMBERS OF CASES FOR SPRAYED GROUPS BASED ON RATE AMONG NON-SPRAYED GROUP OF SURVEYED AREA

		Persons Sprayed and Not Sprayed for Survey Area Week Ending:								7/15 to 8/22			7/15 to 9/26	
Age	Spray Status	½ Wk. 7/18	7/25	8/1	8/8	8/15	8/22	Total Persons	Weeks of Life 7/15 to 8/22	Actual Cases 2 Weeks + 1st Spray to Onset	Theoretical Sprayed Cases Based on Rate Not Sprayed	Weeks of Life 7/15 to 9/26	Actual No. Cases 2 Weeks from 1st Spray to Onset	Theoretical Cases in Sprayed Group Based on Non-sprayed Rate
Under 1 year	Sprayed	30	43	44	44	44	46	61	220.5	0	1.9	450	0	2.4
	Not sprayed	31	18	17	17	17	15		115	1		190	1	
1 to 4	Sprayed	124	210	243	251	254	264	316	1,183	3	2.1	2,503	8	3.1
	Not sprayed	192	106	73	65	62	52		555	1		815	1	
5 to 9	Sprayed	197	340	382	394	400	415	516	1,871	2	1.9	3,946	3	2.7
	Not sprayed	319	176	134	122	116	101		967	1		1,472	1	
10 to 14	Sprayed	210	382	433	441	443	453	572	2,083	1		4,348	2	2.6
	Not sprayed	362	190	139	131	129	119		1,063	0		1,658	1	
15 to 19	Spraped	154	279	324	337	340	347	470	1,569	1	3.1	3,304	1	6.0
	Not sprayed	316	191	146	133	130	123		1,016	2		1,631	3	
20 to 24	Sprayed	135	234	271	275	275	279	437	1,296	0		2,691	0	
	Not sprayed	302	203	166	162	162	158		1,008	0		1,798	0	
25+	Sprayed	827	1,444	1,633	1,683	1,706	1,741	2,724	7,956	0		16,760	0	
	Not "	1,897	1,280	1,091	1,041	1,018	984		7,026	0		11,941	0	

7/15 to 8/22:

Total actual sprayed cases	7.0
Total not sprayed cases	5.0
Total theoretical sprayed cases based on non-sprayed rate per week of life	9.0

7/15 to 9/26:

Total actual sprayed cases	14
Total not sprayed cases	7
Total theoretical sprayed cases based on non-sprayed rate	16.8

Twenty cases of non-paralytic illness were eliminated from consideration, of which number 9 had not employed the spray, 4 had used it for less, and 7 for more than 2 weeks before the onset of illness.

INFLUENCE OF THE SPRAY UPON THE INCIDENCE OF POLIOMYELITIS IN THE BIRMINGHAM AREA

Obviously it was not possible to control this field trial strictly by refusing the experimental prophylactic to every other person who applied; consequently, those who voluntarily elected to spray and not to spray constituted the test and control groups for the study.

The number of persons who employed the spray increased from day to day so that the relative size of the two groups continually varied. It, therefore, became necessary to determine as accurately as possible when each sprayed individual of the surveyed areas began the applications.* With this information at hand it was possible to calculate the number of sprayed and not-sprayed weeks of life lived by individuals of the two varying groups for the period covered by the survey (Tables II and III).

In this compilation every person that sprayed, even once, however inadequately, was considered as belonging to the sprayed group thereafter. Likewise, every case that developed after spraying, however faulty or inadequate the method, was attributed to the sprayed

* Determination of the date of the first spray was facilitated since general spraying began promptly following the first physicians' meeting on July 15, 1936, which was also the date on which the chemicals became rather generally available. Often the date of first spraying could also be fixed with reference to the development of poliomyelitis in some friend of person of the neighborhod.

group. Several cases might with justice to the spray have been eliminated from consideration had we known how many of the sprayed group not developing the disease had similarly sprayed. It was not felt, however, that lay inspectors should be trusted to pass upon the efficiency of the spraying.

If we are correct, the picric-alum spray exerts its protective effect by rendering the nasal membranes impervious to the virus; therefore, the spray could have no effect in preventing the disease when the virus had already entered the olfactory nerve. Now, if we assume the interval from invasion of the nerve to onset of symptoms to be from 7 to 10 days and, allowing 4 to 7 days for the repeated sprayings to induce a reasonable degree of resistance, we arrive at a period of 14 days following the first spray before protection might be regularly expected. We have therefore ruled out of consideration all sprayed and unsprayed cases developing within 2 weeks following the institution of the spraying campaign, and all sprayed cases developing in less than 14 days from the first spraying. This leaves us 12 paralytic white cases for consideration, 7 in sprayed and 5 in the non-sprayed individuals. Had the sprayed group suffered the same incidence, based on weeks of sprayed and not sprayed life, as did the non-sprayed group, there should have been 9 cases instead of actually 7 in the group (Table II). Applying the same reasoning to the colored cases of which there were 3 in the unsprayed group and none in the sprayed

TABLE III

CASES OF POLIOMYELITIS IN COLORED PERSONS, BIRMINGHAM AND JEFFERSON CO., BY SPRAYED AND NON SPRAYED GROUPS AND AGE PERIODS AND THEORETICAL NUMBER OF CASES FOR SPRAYED GROUPS BASED ON RATE AMONG NON SPRAYED GROUPS

Age	Spray Status	Persons Sprayed and Not Sprayed for Surveyed Area Week Ending ½ Wk 7/18	7/25	8/1	8/8	8/15	8/22	Total Persons	Weeks of Life 7/15 to 8/22	7/15 to 8/22: Actual Cases 2 Weeks + 1st Spray to Onset	Theoretical Sprayed Cases Based on Rate Not Sprayed	Weeks of Life 7/15 to 9/26	7/15 to 9/26: Actual No. Cases 2 Weeks from 1st Spray to Onset	Theoretical Cases in Sprayed Group Based on Non-sprayed Rate
Under 1 year	Sprayed	5	9	15	17	17	17	38	70	0	0	155	0	0
	Not sprayed	33	29	23	21	21	21		139	0		244	0	
1 to 4	Sprayed	55	89	112	123	127	127	231	556	0	7	1,191	1	1 6
	Not sprayed	176	142	119	108	104	104		715	1		751	1	
5 to 9	Sprayed	81	126	155	167	173	176	299	770	0	9	1,656	1	1 1
	Not sprayed	218	173	144	132	126	123		875	1		1,490	1	
10 to 14	Sprayed	87	146	184	196	200	202	321	892	0	0	1,902	0	0
	Not sprayed	234	175	137	125	121	119		873	0		1,468	0	
15 to 19	Sprayed	66	108	136	145	153	154	276	668	0	8	1,438	0	1 0
	Not sprayed	210	168	140	131	123	122		850	1		1,460	1	
20 to 24	Sprayed	55	95	116	125	128	128	293	569	0		1,290	0	0
	Not sprayed	238	198	177	168	165	165		1,042	0		1,867	0	
25+	Sprayed	273	467	587	633	657	661	1,538	2,879	0		6,184	0	1 2
	Not "	1,265	1,071	951	905	881	877		5,580	0		9,965	2	

Population 37% Colored

Total actual sprayed cases	0	Actual sprayed cases	2
Not sprayed cases	3	Not sprayed	5
Total theoretical No. sprayed cases	2 4	Theoretical No. cases based on weeks of life per not sprayed case	4 9

(Cases—based on weeks of life and No. cases in non-sprayed group)

group, we find that in the latter there should theoretically have been 2.40 (Table III). Combining colored and white, there were actually 7 cases in the sprayed group while theoretically we might have expected 11.4 cases.*

When we consider the method of spraying practised for the 7 failures credited to the spray, we find that all were home-sprayed.

1. One (W. M. 2) was sprayed according to schedule for 23 days before onset by means of a nebulizer which threw a scarcely visible vapor.

2. A young man (W. M. 17) sprayed but twice, the last time 19 days before onset of symptoms.

3. A child (W. M. 2) was sprayed according to schedule for 33 days prior to onset but the atomizer at the time of the investigation was defective and between 80 and 90 sprayings are said to have been made from a bottle of solution from which only 13 c.c. had been removed.

4. Another (W. F. 3) was sprayed according to schedule for 35 days, the applications being made while the child was asleep.

5. Another (W. F. 8) was sprayed regularly for 3 weeks, one puff up each nostril.

6 & 7. (W. F. 12 and W. M. 9). These were sprayed in the recommended manner and with approved equipment for 28 and 30 days respectively.

CASES OF POLIOMYELITIS DEVELOPING AFTER THE SURVEY

Following the survey completed on August 22, 14 additional cases of poliomyelitis developed in Birmingham and Jefferson County to September 26, 1936. However, no house-to-house survey was made thereafter. The weeks of sprayed and non-sprayed life for the period has therefore been calculated upon the assumption that no additional spraying was instituted after August 22. Any error thus introduced is against the spray, so we felt justified in considering 1 case (W.M.15) who sprayed but once on August 8 and developed poliomyelitis 41 days later as belonging to the unsprayed group. A second case that had sprayed regularly from July 15 to August 15 had her tonsils removed on August 27 and developed poliomyelitis 10 days later. This operation so obviously broke the natural barriers that this case has been eliminated from consideration. Thus, considering the whole period July 15 to September 26, we have a total of 14 sprayed and 7 unsprayed white cases (Tables II and III). Had the same rate prevailed in the sprayed as in the unsprayed, there should have been 16.8 cases in the treated group. Among the negroes there were 7 cases, 2 in the sprayed group, while theoretically there should have been 4.9 cases. Thus, instead of 16 cases among the sprayed of both colors, we should have expected 21.7 (a reduction of 35 per cent).

The history of the spraying in the late occurring cases was taken by the Department of Health nurses and shows many irregularities noted in the earlier cases, with the additional criticism that many discontinued spraying with the decrease in reported cases.

Two had sprayed so irregularly that dates could not be approximated, 1 of the 2 had not sprayed for 3 or 4 weeks prior to onset. Two others had sprayed regularly but not at all for 4 to 8 weeks prior to onset of poliomyelitis.

Four are said to have sprayed regularly to the time of onset but the exact method employed is not known. There was no apparent difference in the severity of the attack among sprayed and not sprayed individuals.

SPRAYED CASES OUTSIDE BIRMINGHAM

Sixteen cases of poliomyelitis reported prior to September 1 from outside the Birmingham area, in Alabama and in Tennessee, were also investigated. Four of these proved to be non-paralytic illnesses, 3 developed symptoms less than 9 days following the first spray, 3

* What influence, if any, the spray might have had upon the carrier state is unknown.

sprayed every other day for 1 week then discontinued. The symptoms in these 3 cases developed 9, 15, and 17 days, respectively, from the last spraying. The actual infection in these cases, therefore, probably took place at a time when protection should have been expected. The remaining 6 cases were, according to the history, regularly sprayed for from 18 to 54 days prior to onset of symptoms and the method was in accordance with instructions. Two of the cases were, however, in chronic mouth breathers with gross nasal obstructions, and while possibly explainable on this basis, are nevertheless chargeable against the method in which anatomical considerations play an unavoidable rôle.

DISCUSSION

Whether the results would have been better had the spraying been carried out more effectively is unknown, but the method employed in some cases was such that we could hardly have expected results, however effective the method when well applied.

The development of poliomyelitis among persons apparently sprayed according to instructions, however, suggests either that the chemicals are not effective for man or the advised method of application, which Drs. Peet and Schultz have shown effective for monkeys, was not as practised, trustworthy for man.

The apparent, though small, reduction in the expected number of sprayed cases suggests the latter alternative, and it is possible that the greater nasal distances and larger surfaces to be covered in children are important considerations in this connection. Furthermore, many children, especially of the most susceptible age groups, actively resisted and thus rendered their spraying difficult—resistance was not a factor of importance in the animal work.

Numerous instances were also encountered where spraying begun with 3 or 4 atomizer puffs up each nostril was gradually reduced to one pressure of the bulb. This suggests that the operators had discovered that there was less objection by the patients, the milder the application. It is, of course, next to impossible to ascertain from a history such important factors as the vigor with which the bulb of the atomizer was actually compressed in spraying, but it is probable that there was some tendency to lessen complaint by spraying in a feebler and feebler manner. Should future studies indicate that the atomizer affords the best method of application, the power atomizer, adjustable to the most effective pressure offers definite advantages over the variable hand apparatuses so generally employed during the past summer.

Certain it is, that the best method for applying the chemicals was not employed in all the prophylactic failures encountered, and it is furthermore probable that the most satisfactory solution has not yet been found. It is therefore obvious that further experimental work directed toward the finding of a more dependable method of application and of a more ideal solution be continued.

CONCLUSIONS

1. Chemicals capable of blocking the olfactory route of infection must be thoroughly applied to the nasal vault if maximum protection is to be secured.

2. Many children actively resist and thus render spraying difficult.

3. Sympathetic parents, unfamiliar with the anatomy of the nose, are not, as a class, qualified to administer intranasal prophylactics properly.

4. A house-to-house survey revealed complaints by 885 from among 4,631 sprayed individuals. Headache, temporary nausea, burning of nostrils, symptoms of head cold, irritated throat, and irritation of eyes, in the order named, were the most usual complaints. Had the applications of the chemicals been

more uniformly thorough more unpleasant consequences might have developed.

5. Seven instances of hypersensitivity or of idiosyncrasy to the drugs were reported from the whole epidemic area.

6. The actual incidence of poliomyelitis in the group sprayed by whatever method was somewhat less than the calculated incidence based upon the rate in the unsprayed control group (16:21.7) (Birmingham area).

7. The occurrence of cases in persons who had sprayed for several weeks in the advised manner throws question upon the method as employed.

8. In the face of an epidemic of poliomyelitis the people can be relied upon to employ any simple, inexpensive prophylactic method of promise.

9. It seems probable that the most effective method of application, as well as the most ideal solution, has not been found yet. Investigative work should therefore be continued.

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Snow on Cholera

OUT of about 500 books submitted by publishers, printers, and designers, *Snow on Cholera* has been selected as one of the *Fifty Books of the Year*, and with 49 others will be exhibited by the American Institute of Graphic Arts as an example of American bookmaking in the year 1936. The choice was made on the merits of physical attractiveness, suitability to purpose, and the success with which the designer has met the problems imposed by editorial content and conditions of production. The books eligible were those published between December 1, 1935, and December 1, 1936, and manufactured in the United States or Canada. The selections were made by a jury of three—a librarian, an authority on fine historical printing, and a book designer.

The complete list of books chosen will be made public at the opening of the Fifty Book Show on February 15, 1937. In past years, the jury has shown a fine impartiality with regard to the kind of book selected. In 1935 an encyclopedia, novels, illustrated books, poetry, new editions of classics, textbooks, as well as autobiographies and histories, were included in the selection. Only 8 books were priced at $10 or over, and 32 cost less than $5, showing that in the eyes of the jury standards of book production may be met by the inexpensive book if care is given to the workmanship and to the choice of type and material.

Public Health Aspects of the Treatment of Water and Beverages With Silver*

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PUBLIC health workers have been greatly interested for many years in the presence of metallic substances such as arsenic and lead in foods and more recently in the presence of antimony. These substances have usually gained entrance to foodstuffs either accidentally or by technical methods designed to produce better quality foods. In general, however, such substances have not been deliberately added with the full knowledge that the consumer will ingest regular and definite quantities.

We now have another member of the metallic group, namely, silver, which certain commercial organizations are recommending for use as a bactericidal and preserving agent. Before the general use of a method designed to add silver becomes widespread, public health authorities should consider whether or not the public health hazard from the ingestion of silver is comparable to the known dangers from other metallic compounds and, if so, what concentration of silver can be considered safe in foods and in drinking water.

From a bacteriological viewpoint, silver is one of the most active ions, exceeded only by mercury. Silver nitrate, colloidal silver, and certain other silver compounds are among the most generally used bactericidal agents, while metallic silver has been used in surgical technics for many years. One of the reasons for such widespread use is that even very small amounts of silver possess bactericidal action and even relatively high dosage does not produce any immediate pathological or physiological change.

The peculiar growth-inhibiting or bactericidal action of silver was first noted by Naegeli in 1893. Since that time there have been a great many publications dealing with various aspects of the bactericidal action of silver. Some 200 publications, mostly dealing with various theories to explain the action of silver, have been consulted. Unfortunately, many of the more recent papers have been obviously presented with the commercial aspects to the fore. It was therefore decided that with a few exceptions the literature should be eliminated from our considerations and the principles involved should be studied first-hand.

In general, there are 3 commercial

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methods of using silver. One corporation has patented various methods of exposing water and other liquids to silver deposited on sand, porcelain and various types of filtering devices. A method of applying silver by electrolysis has also been patented. Another commercial process combines heat in addition to the difference in E.M.F. which exists between silver and nickel electrodes when kept at different temperatures in the material to be treated, and may be considered to be a modified pasteurization process. In all cases which have come to our attention the objective is the same, namely, to secure the solution of silver. Apparatus has been designed and recommended for the treatment of water, ice, milk, beer, vinegar, wine, alcohol for perfumes, liqueurs, gin, whiskey, brandy, cider, and fresh fruit juices—in fact, there is hardly a food industry in which water plays any part that silver treatment has not been recommended as a valuable agent.

It does not seem reasonable that such methods should be permitted general or widespread use until we have some very definite knowledge as to exactly how efficient they may be under a great variety of conditions. The common method of heat preservation should not be lightly thrown aside for this process, which, at least on this continent, has been given little serious attention up to the present.

Our department became interested in the problem first in reference to the application of silver as a method of treating domestic water. This aspect of the problem was studied and a résumé published by the author.[1] At that time it was concluded that the application of the oligodynamic action of metallic silver to the treatment of water could not be recommended for practical use. Since then we have had to take cognizance of the extension of this process to the preservation of fruit juices, vinegar, etc. Certain fundamental research has been carried out in our laboratory, the results of which will be presented as briefly as possible. The exact technical details will not be given here, but can be made available to those interested.

EXPERIMENTAL

The majority of the following experiments were conducted in glass containers, but a sufficient number of controls in quartz containers was also carried out to indicate the validity of the results.

1. *Metallic Silver*—Silver metal possesses marked oligodynamic or bactericidal power, which may be clearly demonstrated by embedding a piece of metal in an agar plate seeded with *B. coli*. The oligodynamic action may be seen by the absence of growth in a small area surrounding the metal. The width of the zone may be increased by treating the metal with nitric acid, and may be decreased by careful cleaning. Fused silver chloride or horn silver, silver chloride, and various concentrations of silver nitrate show a similar oligodynamic activity.

On the assumption that the bactericidal properties of silver might be due to ionized silver, probably from silver oxide, the following experiment was set up: Small pieces of pure silver metal were melted in a home-made quartz furnace. Each piece was subjected to a different treatment with the following results:

A. Silver melted in air and cooled in hydrogen, or melted in hydrogen and cooled in hydrogen showed no evidence of any inhibitive action. Silver cooled in hydrogen had not regained its bactericidal properties 3 months after such treatment, although kept at room temperature exposed to the air (Figures I and II).

B. Silver metal heated in air and cooled in air, or heated in hydrogen and cooled in air

showed a zone of inhibition about 3 mm. wide, but if cooled by dropping into water the zone was at least 6 mm. wide.

It was therefore concluded that pure silver metal has no bactericidal or inhibitory action, and that the inhibitive properties of ordinary silver are probably due to silver ions coming from silver oxide which develops during the cooling process when most of the oxygen absorbed by the silver is released.[2]

These conclusions are in agreement with those of Buhrmam,[3] Bushke, Jacobson, and Klopstock,[4] Doerr,[5, 6, 7, 8] Felippe and Martins,[9] Freundleck and Sollner,[10] Kling,[11] LaCava,[12] Leitner,[13] Markvoort and Wieringa,[14] Wernicke[15 16 17]; although Lakhovsky,[19] Saxl,[20] and Tamman,[21] do not agree.

2. *Silver Salts in Distilled Water*—Silver, whether in the form of silver nitrate, silver oxide, silver chloride, and electrically dispersed colloidal silver exerts similar bactericidal actions against *B. coli* suspended in distilled water, thus:

1 p.p.m. of silver as silver nitrate killed *B. coli* (1 million per c.c.) within ½ hour at 20° C.

1 p.p.m. of silver as silver oxide killed *B. coli* (1 million per c.c.) within ½ hour at 20° C.

1 p.p.m. of silver as silver chloride killed *B. coli* (1 million per c.c.) within 1 hour at 20° C.

1 p.p.m. of silver as electrically dispersed colloidal silver killed *B. coli* (1 million per c.c.) within 2 hours at 20° C.

A commercial apparatus consisting of silver deposited on porcelain had a similar action, but since the amount of silver in solution steadily increases with time, it is not practical to express our results in the same manner.

3. *The Effect of Peptone and Grape Juice on Silver Nitrate*—In the presence of peptone and grape juice, silver nitrate, silver oxide, and colloidal silver show a marked reduction in bactericidal activity.

Bactericidal action of Metallic Silver on B. coli.

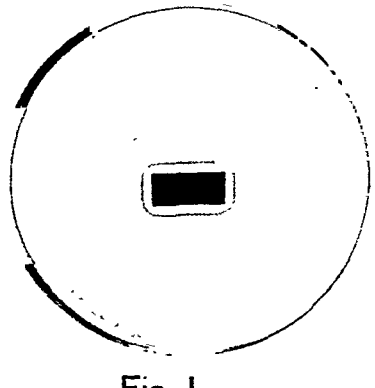


Fig 1.
Untreated pure silver, showing zone of inhibited growth

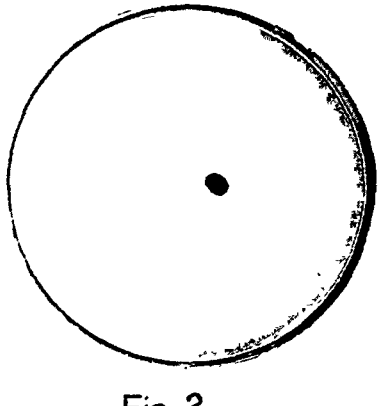


Fig 2.
Silver melted and cooled in hydrogen, showing absence of inhibition of growth.

10 p.p.m. of silver as silver nitrate were required to kill *B. coli* (1 million per c.c.) within 3 hours in the presence of 2 per cent peptone.

10 p.p.m. of silver as silver nitrate were required to kill *B. coli* (1 million per c.c.) within 3 hours in the presence of 10 per cent grape juice, although in the presence of 1 per cent grape juice 2 p.p.m. were effective within 3 hours.

Considerably more than 10 times the amount of silver effective against *B. coli* in distilled water is required to produce a similar bactericidal action in 2 per cent peptone and 10 per cent grape juice.

4. *Effect of Glucose on Silver Nitrate*—Further studies showed that silver nitrate is not markedly affected by glucose.

1 p.p.m. of silver as silver nitrate killed *B. coli* (1 million per c.c.) within 1 hour in the presence of 4 per cent glucose, while heating a glucose-silver nitrate solution increased the time required to 1½ hours.

It was, therefore, concluded that the sugar in the grape juice was not the factor affecting the action of silver nitrate but rather the protein fractions.

5. *Silver Oxide*—Silver oxide prepared by the method of Johnston, Cuta, and Garrett [22] behaved in a similar manner to silver nitrate in distilled water, peptone solution, and in grape juice. However, it was found that glucose has a marked effect upon silver oxide. This was to be expected from the work of Whitby,[23] who used the reduction of silver oxide to colloidal silver by sugar as a means of determining small amounts of silver.

When tested bactericidally it was found that:

1 p.p.m. of silver as silver oxide killed *B. coli* (1 million per c.c.) within ½ hour in the presence of 2 per cent glucose, but when the oxide-glucose mixture was heated to increase the rate of reduction the solution failed to kill *B. coli* (1 million per c.c.) within 24 hours.

6. *Colloidal Silver*—The experiments conducted with silver oxide were repeated, using electrically dispersed colloidal silver [18] and silver oxide reduced with hydrogen (Kohlschutter's sol), with similar results. Certain physical chemists believe that the stability of an electrically dispersed silver sol depends upon silver oxide. It would appear from our studies of the bactericidal action of colloidal silver that such is the case. Further studies along this line may provide the physical chemists with definite proof of their theory.

7. *Silver Chloride*—A few experiments were conducted with silver chloride in distilled water. The results are essentially similar to those obtained with other forms of silver. The relative insolubility of silver chloride limits the amount of work that can be done, and as a result we did not actively pursue this phase of the work.

8. *Electrolysis of Silver*—Silver electrodes were immersed in an agar plate seeded with *B. coli* and an E.M.F. of 1.5 volts applied for varying intervals. The electrodes were then removed and the plates incubated in the usual way. It was found that a zone of inhibition of growth surrounded the hole in the agar made by the anode, but that when a carbon electrode was substituted for the silver electrode no inhibition occurred. In no case were there any signs of inhibition surrounding the hole made by the cathode.

9. *Commercial Silver Apparatus*—The results previously reported by the author [1] dealing with a commercial method of applying silver to water through the use of silver deposited on porcelain rings have been confirmed and need not be repeated at this time. In general, the temperature at which water is exposed to the action of silver has a marked effect on the time necessary to kill *B. coli*. At 10° C. (50° F.)

it may require 7 hours to kill the same number of organisms killed at 22° C. (71° F.) in 1½ hours. Organic and inorganic constituents also markedly increase the length of time necessary to kill *B. coli.*

At a recent meeting of the New England Waterworks Association, Hale and Shapiro [24] reported on the use of silver in treating swimming pools. They stated that ammonia present in the water prevented the bactericidal action of silver; also, that the 37° C. total count is not affected, and among those bacteria may be disease germs affecting the eye, ear, nose, and throat. Furthermore, the required time for sterilization is too long, at least 2 hours. Attention is drawn to the relative costs of silver and chlorine treatment.

10. *Silver in Certain Food Materials* —The presence of silver in certain food materials has been studied by J. Dick of this department. Mr. Dick has made a series of spectrographic analyses and has kindly permitted me to present the material in Table I.

TABLE I

Fresh Fruit	*Silver Parts per 1,000 Million*
Tomato Juice	0
Australian Oranges	0
Jamaica Oranges	0
California Oranges	0
Lemons	0

Commercial Fruit Juices, Vinegar etc.	*Container*	*Silver Parts per 1,000 Million*
Grape Juice	Glass	less than 5
Grape Juice	"	" " 5
Apple Cider	"	" " 5
Tomato Juice	Tin	" " 5
Tomato Juice	"	" " 5
Cider Vinegar	Glass	" " 5
Cider Vinegar	"	25
Malt Vinegar	"	less than 5
Malt Vinegar	"	" " 5
Malt Vinegar	"	50
Spirit Vinegar	"	less than 5
Distilled White Vinegar	"	50
Evaporated Milk	Tin	less than 10
Milk, Sweetened, Condensed	"	11
Maple Syrup	Glass	less than 5

It is obvious that silver does not occur in significant quantities in this class of foods. Further data on this subject will be collected in the near future. Commercially, it is understood that the amount of silver to be added to various food materials will vary between 0.05 p.p.m. and 1 p.p.m., which, as will be readily seen, constitutes a definite addition of silver.

A series of fruit juices supposedly preserved by silver process were secured for study, and the results may be briefly summarized by stating that significant amounts of silver were not found spectrographically, as will be noted by Table II.

TABLE II

Juices Supposedly Treated by Silver Process	*Container*	*Silver Parts per 1,000 Million*
Strawberry	Glass	10
Tomato	"	less than 5
Black Currant	"	" " 5
Cherry	"	" " 5
Apple	"	" " 5
Gooseberry	"	40

Two of the bottles from samples supposedly treated by silver were drained, but not rinsed, and then treated with warm nitric acid, the solution concentrated and spectrographed. No silver was found in significant traces to suggest silver precipitated on the glass.

Furthermore, studies of the death rate of *B. coli* suspended in these fruit juices showed that there was no significant difference in the death rate in silver treated grape juice as compared with fresh, normal grape juice prepared without silver, or in a citrate buffer of the same pH. It was also found that the growth curve for yeast inoculated into this commercial grape juice was almost identical with the

curve obtained in fresh, normal grape juice. The obvious conclusion is that the silver treatment was either inefficiently applied or that the method used did not permit of solution of silver.

SOME PUBLIC HEALTH ASPECTS

Argyria is a well known although not very common clinical manifestation of silver poisoning. Gaul and Staud [25] have reported on the development of argyria following treatment with silver arsphenamine, and in a later publication [26] dealt with some 70 cases of argyria which developed after the use of other forms of silver medication. These authors have determined from biopsy materials the amount of silver present in normal persons. They state that "normally, an individual in the fifth decade of life has a silver retention equivalent to from 1 to 2 gm. of silver arsphenamine." If silver compounds have been used this quantity will be greatly increased. They also state that argyria becomes evident after a silver retention approximating an equivalent of 8 gm. (1.2 gm. silver) of silver arsphenamine. Therefore, the more silver an individual has accumulated the less it will take at a later date to produce argyria. It is obvious that this amount will constitute an individual problem.

Argyria, so far as one can determine from the literature, does not seem to produce any serious effect on the body outside of the discoloration of exposed parts. It should, however, be clearly pointed out that very little is known concerning the actions of silver when ingested. Most of the references in the literature refer to poisoning by silver compounds following the ingestion of rather large quantities, or the development of argyria after prolonged treatment with silver preparations. No data are available as to the amount of silver retained following the administration of small doses. Cases of argyria are very seldom met with and, so far as can be determined from the literature, no systematic study of mortality rates, physiological disturbances, etc., have been made.

It is definitely known that the salts of heavy metals have a strong inactivating action on enzymes. Waksman and Davidson [27] have discussed this aspect. For example, 0.005 mg. of mercuric chloride per liter, or 1 part in 200 million, is sufficient to reduce by 50 per cent the activity of many catalase preparations. It is stated that silver nitrate is 3 times as active against diastase as mercuric chloride. These authors also say that "the action of silver nitrate is similar but greater than that of the mercurial salt." Enzyme inactivation by salts of heavy metals may be reactivated by certain neutral salts of the alkalis and alkali earths. It is obvious, therefore, that the effect of silver on enzymes should be very carefully studied before any definite opinion is given as to whether or not similar inactivation occurs in the digestive tract.

The amount of silver ingested in foods and water treated by silver must be considered. The commercial apparatus (silver deposited on porcelain rings) liberated, in our experiments, 0.03 p.p.m. of silver in 1 hour and 0.5 p.p.m. in 8 hours. The electrical method of applying silver will liberate varying quantities, depending upon the current. According to Faraday's law 1 ampere flowing for 1 hour will liberate 4.023 gm. of silver. The electrical method of applying silver provides a more certain method of controlling the rate of solution of silver, but it has a disadvantage in that the rate can be greatly increased by the operator. If under practical conditions it is found that the usual dosage is not producing

the required preservative or bactericidal action, a much greater concentration of silver can be applied by simply increasing the current. If there is any health hazard in the use of silver, it is obvious that unscrupulous persons could expose the public to relatively high dosages of silver. Commercial recommendations as to the amount of silver required to treat water and food vary from 0.05 to 1.0 p.p.m. (1 p.p.m. is equal to 1 mg. per liter.)

It is important to know how much of the silver ingested will be retained in the body. So far as can be learned there are no data available and it is, therefore, just as incorrect to assume that most of the ingested silver is absorbed as to assume that it is excreted. It is more important to know whether or not such amounts will have any effect on enzymes in the digestive tract, and finally it is essential that if this process is to be permitted some definite limit as to the amount of silver permissible in foods and water be established.

Public health officials have considered it necessary to establish limits governing the amount of lead (2.5 p.p.m.) and arsenic (1.5 p.p.m.) in food materials. Whether or not silver can be considered in the same category must be decided on further scientific evidence. It should be emphasized that we are not dealing with the accidental occurrence of silver in foods but with a commercial process designed to add silver as a preserving agent. In this respect, the situation is entirely different from that which obtains in connection with lead and arsenic and, therefore, needs special consideration.

Another possible hazard in the use of silver as a preserving agent in foods is that the bactericidal effect may gradually disappear through formation of inactive compounds, with the result that the public would have a false sense of security as to the safety of foods.

The general principle of adding chemical preservatives to foods has been one of the most contentious problems of food and drugs administration. The addition of silver to foods is chemical preservation and, therefore, it is incumbent upon public health officials to ascertain whether or not this method constitutes a health hazard.

It must also be determined whether the silver treatment is safe from the standpoint of food preservation. In the meantime it is recommended that official approval be not given pending further studies.

CONCLUSIONS

1. As a result of many experiments with metallic silver, colloidal silver, silver oxide, and certain commercial methods of using silver, the conclusion has been reached that silver metal possesses bactericidal action by reason of the solution of silver ions, probably from silver oxide. It is believed that this conclusion is strengthened by the fact that reduction by glucose substantially lessens the bactericidal action of electrically dispersed silver (colloidal silver), and silver oxide. In other words, the bactericidal activity of silver is due entirely to ionized silver.

2. Silver nitrate, silver oxide, electrically dispersed colloidal silver, when diluted on the basis of silver concentration, all possess a similar bactericidal or oligodynamic activity.

3. The bactericidal activity of silver nitrate or of silver oxide is markedly reduced by the presence of proteins or glucose.

4. Grape juice purported to have been commercially treated by a silver process did not show significant amounts of silver either spectrographically or bacteriologically.

5. Attention is called to the reported effect of silver on enzymatic action, and the occurrence of argyria is discussed.

6. Silver in certain normal food materials has been estimated by spectrographic analysis, and in the substances examined was not found to be present in significant proportions.

7. It is recommended that the use of silver as a preserving agent in foods, or as a method of treating polluted water, be carefully considered by public health officials, and that the method be not used until all doubts concerning the health risk are removed by indisputable evidence to the contrary.

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University of Michigan Public Health Engineering Courses

THE following information has been received from the University of Michigan, Ann Arbor, Mich.:

Programs of study in Public Health Engineering are now being offered in accordance with the "Preliminary Report of the Sub-committee of the Qualifications of Public Health Engineers" (*American Journal of Public Health*, 26, 6 (June), 1936). Two new courses are scheduled for the second semester of the school year 1936–1937.

1. *Civil Engineering 37*—"State Health Department Sanitary Engineering Practices" in the College of Engineering is a study of state laws, regulations and policies under which sanitary engineering activities of state departments of health are conducted, current procedures, practices and standards, regulatory functions, consultation services to local official agencies in both urban and rural sanitation, and the further application of sanitary engineering science in the field of public health.

2. *Hygiene*—"Public Health Engineering Laboratory" in the Division of Hygiene and Public Health is a study of the applications of sanitary biology and chemistry in the control and operation of water purification and sewage treatment processes, and the study of Stream pollution and industrial wastes. The course includes lectures, demonstrations, and laboratory exercises.

The above courses are designed for engineers of state health departments and should be taken concurrently.

In addition to the courses given in the College of Engineering and the Division of Hygiene and Public Health, other courses are available in other departments from which elections may be made to meet the special needs of the student. Since the problem of training Public Health Engineers falls within the joint province of engineering and public health, the two units directly concerned—Division of Hygiene and Public Health and College of Engineering—will engage in a joint educational program. The object is to equip the student for administrative and technical work in the many engineering problems which concern the public health worker. The problems include, in addition to the generally recognized fields of water purification, sewage disposal, garbage disposal, etc., such fields as industrial sanitation, illumination, state and municipal engineering practices and others.

Malaria Control—Comments on the Past and Future*

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IN selecting a subject so comprehensive as the title of this paper indicates, the writer is not unmindful of the unlimited scope of time and activities that might be covered. A natural division of time in malaria control would be (1) from Varro to Ross, and (2) from Ross to the present and beyond.

Paludismo (malaria) has been associated in the Italian and Roman minds with marshes and swamps for ages, and so positive were they, that drainage against the disease in connection with agricultural development was inaugurated more than 5 centuries ago. How near they were century after century to the conclusion that Ross reached in 1898! Yet the Italians named it "bad air disease," instead of "pond disease," which more nearly describes malaria in our country, since our principal vector (*Anopheles quadrimaculatus*), is essentially a pond breeder. Although all mosquitoes are both aquatic and aerial in their life cycle, the Italians, basing their nomenclature upon age-old observations that ingestion or contact with water did not result in malaria attacks, assumed that "bad air" was the causative agent. Considering the basic source, "Malaqua" would have been more nearly descriptive epidemiologically.

Not only the Romans and Italians but inhabitants of other malarious lands, long before Ross's and Grassi's work on malaria transmission by mosquitoes, were applying drainage as a measure against malaria. In the United States as early as 1804, (132 years ago), standing water was recognized as, at least a contributing factor in the "malignant incidental cause of disease." At Savannah, Ga., in 1804 when the Georgia Medical Society was legally incorporated, one of this society's main purposes was "lessening the fatality induced by climate and incidental causes and improving the science of medicine." For many years prior to this time, rice had been grown extensively around Savannah, with a high attendant malaria rate. The first major efforts of the newly organized medical practitioners were directed against rice culture. This society went on record as follows: "There could be no worse or more malignant incidental cause of disease, than the *stagnant water which remains on a rice field exposed to an ardent summer's sun.*" Accordingly, the society unwilling to be complacently satisfied with drafting of resolutions (as too frequently is the case), proposed and demanded the prohibition of "rice culture within one mile of the city limits." The lands were valuable, and so were the rice crops. It must have appeared to the planters that undue demands were made

* Read before a Special Session of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

upon them for the sake of health. Finally a plan was offered wherein a stipulated sum per acre was to be paid for the land and a lien attached, "*that it never should be employed in wet culture.*" So, in 1817 the landowners came to terms and for $40 per acre agreed to bind themselves and their lands "*forever from wet culture.*" The city of Savannah at that time had a population of 4,000—2,000 whites and 2,000 slaves. Since only the whites were property owners, the 2,000 white people paid $200,000 (per capita tax of $100) into the project, a public spiritedness and example of local self-government worthy of the most devout emulation today. This drastic measure must have lessened malaria incidence, but there remain today old rice field canals and undrained ponds in this and adjoining counties which produce *Anopheles quadrimaculatus,* while malaria and drainage still go on.

As was to be expected, the epochal work of Ross, Grassi, *et al.,* in proving Anopheles mosquitoes to be the vector of malaria, added a great stimulus to mosquito control during the past 38 years, the major works of which have been drainage. Where made economically feasible through concentrated population, per capita wealth and an accommodating topography, this is the more nearly ideal means of satisfactorily reducing *Anopheles quadrimaculatus.* However, it is a true saying that "*no drainage system is better than its outlet,*" and it may be added that *no drainage system functions long without maintenance.* Herein lies a fault in practically all the antimalaria drainage accomplished in this country. In fact, the writer knows of none in the South where permanent upkeep is provided. There has been much enthusiasm displayed and energy expended toward initial antimalaria drainage during recent years, but provision for maintenance, at best, has been like the "poor man's lease—from year to year."

Another phase of drainage should be brought boldly to the front—where, why, and how to drain. During the past 3 years in one of the major efforts to supply employment to the millions out of work, malaria control drainage was undertaken with such forces. In various states having malaria problems, more or less, this plan was first carried on under CWA, then FERA and lastly under WPA. Owing to the speed with which such employment was to be met and the continual indefiniteness during the periods of work, these efforts could not be regarded, by those professionally and by experience trained in malaria control, as a rounded *program* of malaria control, such as would have been set up under normal conditions, with equal funds available and a long period over which to plan and to execute antimalaria drainage. The primary purpose was "putting men to work." It was simply a paraphrasing of a slogan of 1917 to "put the men in the trenches before Christmas." If this had been the *ideal* plan instead of an *exigency,* as everyone should know, it would have first contemplated comprehensive malaria and mosquito surveys, detail engineering surveys, and drainage operations under expert professional engineering.

Permit a quotation from one of the leading malaria engineers in this country: "It has been necessary for us to stand by rather impotently and see 10 millions of dollars expended for 'ditching' when it might at little extra expense have been expended for *effective malaria drainage,* although we have been able to do much in specific instances to render valuable services in raising *drainage construction* to the plane of *malaria control*" (italicized by the writer). This same engineer states, as to the accrued results from these periods of demon-

stration of malaria control in one of the most active states from *1922–1933*: "As a result, by using several different yardsticks, we find justification in feeling that approximately 15 per cent of malaria cases have been prevented by these demonstrations."

The writer believes that malaria control by drainage will and should be accomplished where economically feasible, while at the same time not believing that all quiet water, ponds and lakes, should be promiscuously regarded as "public health enemy No. 1," without deliberate and impartial trial by regularly constituted and competently trained professional personnel. What to drain and how to accomplish it are questions for the malariologist and the "health engineer" to decide deliberately.

A great deal of the Middle West is now confronted by the advisability of raising its water table—areas where agricultural drainage has been overdone, where the ground water level has been lowered, in some instances, as much as 14 feet. Standing water *per se* is not to be considered a menace. On the contrary, it may be a blessing in the growth of timber, a refuge for wild life and a source of pleasure and profit for man. These are the things to be wisely considered. If the menace to health overbalances the esthetic, the pleasure, the monetary profit, then carefully laid plans for accomplishing drainage and then its maintenance should be applied.

As to other methods of Anopheles control, housing should be given a prominent place. The writer still believes that for most of the malarious districts of the South proper screening of rural homes is today, and probably will be during the next half century, the most hopeful measure. You may ask how can it be brought about. The answer is, through a thoroughly planned program of education. In the rural schools the same texts are used that some of us had 40 or 50 years ago—"See the cat! The cat is on the mat." Then right up through the grades the same insignificant twaddle is taught, more or less. Even when texts are "modernized," one frequently runs across glaring errors, as well as incompetent teachers. As an illustration, in a certain city in the South with a population of more than 100,000, a chiropractor "taught" health, and the textbook told in definite terms how Gorgas discovered that yellow fever is carried by *stegomyia* mosquitoes!

Malaria is still a problem in certain sections of the South dependent upon carelessness of the individual and the communities, the carelessness resting upon ignorance. Most health officials display optimism while speaking in terms of more or less inaccurate figures as to morbidity, mortality, and economic loss from malaria. Twenty years ago one of the world's leading entomologists estimated the loss from malaria annually in the United States at $100,000,000. In 1935 an equally well qualified public health official estimated such loss at $2,000,000,000. The writer leaves these figures with you. He has seen good and bad drainage; good and bad screening of houses; good and bad control by larvicide; good and bad medical treatment of malaria cases—but, if the economic loss from malaria has increased twenty-fold in 20 years, we had better find how the "bars were let down." However, a hidden disease like malaria is hard to reduce to accurate figures.

There is a dearth of information about where and when malaria cases develop—the majority are not seen by the physician, so morbidity reports are scant and death reports, while more complete, do not supply full information upon which to base an adequate program. About 20 years ago, also, after the Italian Government had made a drastic attempt to bring malaria under

control through general distribution of quinine, a "standard treatment" (quinine) was brought to the front in the United States. Its ardent promulgation built up great hopes in its application. In this, disappointment followed, as it is difficult to persuade people to take long continued treatment, even though we can reach them. Also only approximately 20 per cent of those treated may be expected to be freed of infection. In recent years certain synthetic preparations, such as plasmoquin and atebrine have been introduced and both encouraging and discouraging results from a public health standpoint have been reported from their use in substitution for quinine. Rather extravagant claims were made for the "standard treatment" such as clearing, freeing 98 per cent of cases of their parasites by the 8 weeks' treatment. This it will not do in the best possible plan of treating rural populations. Glowing accounts of like results from the administration of atebrine and plasmoquin have been published. These drugs need further checking.

In addition to control of malaria by drainage and house screening and use of drugs, many short-cuts have been proposed. Top-feeding minnows, *gambusia affinis,* were exploited to the point where many health officers honestly believed that malaria could be brought under control by stocking ponds with these little fishes. Probably the most outstanding state health officer in the South for a generation said to the writer in 1922: "In 5 years malaria will not be a problem in this state; all my county health officers are supplying people with gambusia and this will be the answer to the problem." Fourteen years have passed and *gambusia* transplantation as a means of malaria control is being forgotten.

Bats had their flight into malaria "programs," and through salesmanship certain towns and corporations gave up real money for bat-roost blueprints, until the U. S. Bureau of Entomology found that bat-caves were good resting places for mosquitoes, and that post-mortems on bats revealed their stomachs laden with moths, not mosquitoes. "Mosquito hawks" (Odonata) have been thought to be efficient destroyers of mosquitoes. Certain types of vegetation have been promulgated as deterrents to adult mosquitoes and others detrimental to larvae. Of the former, the castor oil plant (*Ricinus communis*). A "certain shrub" growing on Bamboo Key, Fla., and other such places, have been erroneously claimed as deterrents. Also apparently unjustified claims have been made that certain leguminous plants, such as clover, supply female mosquitoes with desirable food and lessen malaria. In Italy an attempt at control of Anopheles was made by stocking waters with *lemna* (a duck weed). Someone read a paper on the lack of Anopheles breeding in water with a growth of smartwood (*Polygonum*), another ascribed the lessened amount of malaria in New Orleans to the presence of water hyacinth (*Piaropus crassipes*). This list might be enlarged, but only to add to the search for the "pot of gold at the end of the rainbow." As to larvicides, many advances have been made in the past two decades. Improvements in both the materials and methods of application are still being effected.

One point may be further emphasized: since malaria in this country is mainly in the rural sections and remains unknown and unreported to health authorities, some means must be had by which these victims can be reached, their cases put into the hands of physicians for adequate treatment, paid for by the family or the county. Both from the standpoints of medical treatment and public health administration we

must have some prompt way of knowing where malaria occurs and under what conditions. Every case of malaria is serious enough to demand treatment by the practising physician. Over vast areas of sparse population, malaria is serious. It is up to the public health profession and the medical profession to coördinate their efforts so that some competent worker, either visiting nurse or medical social worker, comes into contact with the malaria infected person. The malarious sections of the rural districts need, not so much of "white house" conferences, perhaps, but more "log-cabin conferences."

None of us at this meeting would hesitate to live in a malarious community. We are informed; we would screen our abodes, guard against mosquito bites, drain where practicable, treat cases if they occurred, eat nourishing food, etc. But do you know the cracker," the Southern tenant? What are we going to do about him? What can he do about his own problem?

The writer wants to be neither facetious nor pessimistic. There is plenty of encouragement from the past and the present, there is hope that the future may bring economic malaria control, perhaps through some biological methods, necessarily coupled, of course, with an enlightened public mind.

COMMENTS ON DR. GRIFFITTS' PAPER LEADING UP TO THE WRITTEN DISCUSSION

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DR. GRIFFITTS in his comments on the past and future of malaria control has given us something to think about from the standpoint of making our malaria control work in the future more effective.

He has pointed out that much work has been done, some of it even before the transmission of malaria was understood, but has also pointed out the apparent lack of sustained and coördinated work being carried on in so many places today. He has reminded us that the vast amount of drainage work being done under the federal work relief projects was not a well rounded program of malaria control, but was carried out primarily to put men to work. He points out that an ideal plan for expending some 10 million dollars on malaria ditching would have included a comprehensive malaria and mosquito survey, detail engineering surveys and drainage operations under professional direction.

Dr. Wadley and I did not have the opportunity of reading this paper over except for a few minutes this morning, but it is interesting to note that this discussion of his paper, which was written from the standpoint of a city in a malaria section, includes much of the criticism and urge for expert professional direction and coördination as brought out in Dr. Griffitts' paper.

We have prepared a discussion on the past and future of malaria control in Memphis and have included the results of two independent studies carried on this summer. One of the authors of this discussion as Epidemiologist for the Department of Health has inves-

tigated and classified every case of malaria reported this past summer. The other author has attempted to take a weekly pulse of the city as to the prevalence of female *Anopheles quadrimaculatus*. In general, an attempt has been made to learn something definite regarding the transmission of malaria in the city.

Our discussion is as follows:

DISCUSSION

FOR the past 16 years Memphis has carried on an Anopheles mosquito control program under the direction of sanitary engineers, selected because of previous experience in malaria-mosquito control work. Eight years ago the budget for the Anopheles control program was doubled to permit a 10 day oiling schedule for all of the water courses, ponds, pools, etc., during the breeding season, regardless of weather conditions. A year later when the area of the city was approximately doubled by annexation, the Anopheles control program was doubled again to continue the 10 day oiling schedule.

With the almost continuous use of several hundred laborers since the creation of CWA relief projects late in the year 1933, until the present date, practically all of the 178 miles of ditches in Memphis have been worked on.

From the standpoint of mileage the greatest accomplishment has been the cleaning and straightening of ditches and filling the abandoned ditches. From the standpoint of permanent malaria-mosquito control more has been accomplished in the permanent lining of straightened ditches. More than 16 miles of ditches and bayous have already been permanently lined with a concrete or rip-rap center lining with the banks protected against erosion by bermuda sod or rip-rap. This latter phase of ditching work has not only directed attention to its value in permanently increasing the effectiveness of the mosquito control work, but has proved very popular and worth while in the minds of the public and city officials.

It seems fair to assume, therefore, that the control program has been consistent in its effectiveness, with each succeeding year possibly slightly more effective and complete than the year before.

In contrast to this, from the standpoint of malaria transmission, there is a rural area surrounding Memphis in the heart of a comparatively high endemic malaria section of the Mississippi River Valley. Some of the rural counties in this area have health units that carry on some control work, though a very few have carried on energetic and carefully planned programs.

Since the advent of work relief projects some 3 years ago, some ditching work has been done under the name of malaria control by approximately two-thirds of the counties in this area. In counties having health units already studying and planning their malaria program it was an opportunity to carry out some of these plans. To other counties without health units, the problem of using relief labor was thrown in their laps. Drainage work of all kinds needed to be done, but not always did the selections fit into the most effective program of malaria-mosquito control for that area.

An attempt has been made by the federal relief agencies and the various state health departments to select only projects that were worth while to eliminate breeding areas or to straighten and grade bayous and ditches. It has

been necessary to employ insufficient and inexperienced men starting from scratch to direct this work as best they could from an engineering standpoint. They have done a fine piece of work, considering the handicaps.

In the Memphis trade area which includes 66 counties in 3 states, only 22 of these counties have health units. During the past 3 years of federal work relief ditching, 19 of the 66 counties did no ditching; 19 of them completed 0.2 mile per 1,000 population; 9 completed 1 mile per 1,000 population, and 19 averaged approximately 5 miles per 1,000 population. It is interesting to note that the 19 counties averaging 5 miles per 1,000 population had the lowest average malaria death rate.

All of these counties have comparatively high malaria death rates, while 6 of the 66 counties had malaria death rates above 75 per 100,000 population; 5 more showed rates between 50 and 75 per 100,000 population.

A comparison of malaria mortality rates for the years 1929 through 1934 inclusive from Memphis and adjacent sections of the 3 states surrounding Memphis, shows the following:

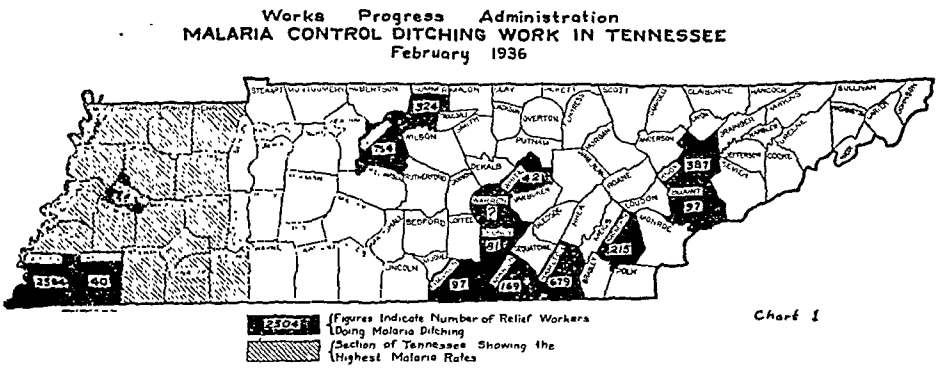
	Average Annual Rate
21 counties in East Arkansas*	59.5
11 counties in Northwest Mississippi*	48.7
26 counties in West Tennessee*	20.9
Memphis, Tenn.	9.1

* Dauer. C. C., and Faust, Ernest Carroll, Ph.D. Malaria Mortality in the Southern United States for 1934. *South. Med. J.*, 29, 7 (July), 1936.

It is easy to see how a resident of Memphis could spend the night almost anywhere in this trade area beyond the city limits on either business or pleasure and be exposed to the Anopheles mosquitoes that have had all the opportunity necessary to be active transmitters of malaria. This is not being offered simply as an alibi for the Memphis rates, but because this question is one which should be considered in studying a problem of this kind. It is possible that this is one of the major sources of infection for Memphis people.

A check-up early in 1936 for the entire state of Tennessee showed that a total of 5,206 men employed on relief work were engaged in malaria control projects. Of these only 99 were working in 2 counties in West Tennessee outside of Memphis and Shelby County on malaria control ditching projects. A total of 2,504 men were employed in Memphis and Shelby County and the remainder, 2,603, were in Middle and East Tennessee (see Chart I). The point is that West Tennessee is the malaria section of the state, and yet, so far as relief projects go, a large part of the work is now being done in a portion of the state where the problem is not so acute. A more recent check-up indicates that none of the Delta or West Tennessee counties except Shelby County are doing any malaria control work at the present time with relief labor. This condition prevails in spite of the efforts on the part of the State Health Departments to promote work in all counties.

It is interesting to note how this problem of putting labor where it will do the most good was worked out in Delaware. Two Civilian Conservation Corp units were assigned to the state of Delaware in 1933 for mosquito control ditching. During the year 1934 and for a few months in 1935, approximately 950 miles of new ditching was installed in about 30,000 acres of marsh land. In addition to this, approximately 665 miles of old ditches have been cleaned and 6,000 man-hours were spent in brush removing. In other words, somewhere between 25 and 30 per cent of the total salt marsh area in the state has already been completely drained in the program of pest mosquito control.



Malaria control work in the Memphis trade area previous to the work relief projects had been carried on for the most part as demonstrations in scattered areas, but with very few county-wide control programs. The reading public, and even health officials not engaged in work in this section and unfamiliar with the malaria mosquito control programs, undoubtedly have the impression that the depression with the resultant enormous amount of malaria control ditching is almost a blessing in disguise in furnishing the means of wiping out or effectively checking the damaging work of the Anopheles mosquito throughout the Mississippi River Delta section. It goes without saying, however, that unless the work is being done where it is needed it should not be considered malaria control work.

In an unpublished discussion at the Institute on Malaria Control held at Jackson, Tenn., on May 28, 1936, Dr. L. M. Graves, Superintendent of the Memphis Department of Health, points out that "There must be some coördinated effort throughout the whole area. The malaria control program now being carried on in the Tennessee Valley Authority is an example of what ought to be done in the entire Mississippi River Delta malaria belt. Until such a coördinated movement is brought about in some way, it seems that we will not attain maximum results in malaria control."

An application to the Works Progress Administration for an epidemiological study on a rather ambitious scale was approved as a survey project in April of this year. The project furnished approximately 45 men for 6½ months. Six of the regular Health Department staff were assigned to direct the individual studies into which the project was divided in order to get results that could be depended on. More specifically, the purpose of these studies may be outlined as:

1. An epidemiological study of each case of malaria reported during 1936 and those that have been reported in Memphis during the past 5 years.

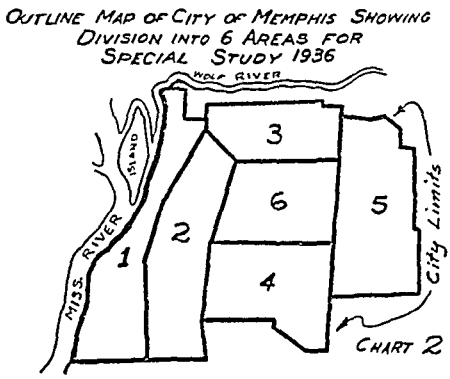
2. To check the effectiveness of the present Anopheles mosquito control work to determine whether the control work is uniformly effective throughout the city, and to determine the cause if certain areas are not as effectively controlled as others.

3. To determine the relationship if possible, between high water stages of the Mississippi River and malaria transmission in the city; and between Anopheles breeding outside the city and any resultant influx of *Anopheles quadrimaculatus into the city.*

4. To determine the seasonal variation of several types of mosquitoes including the *Anopheles quadrimaculatus* in several selected areas of the city. In brief, to take the pulse of the city weekly as to the prevalence of adult mosquitoes.

5. To work out additional routine oiling and other control procedure where feasible and to strengthen any weak points found in our oiling work.

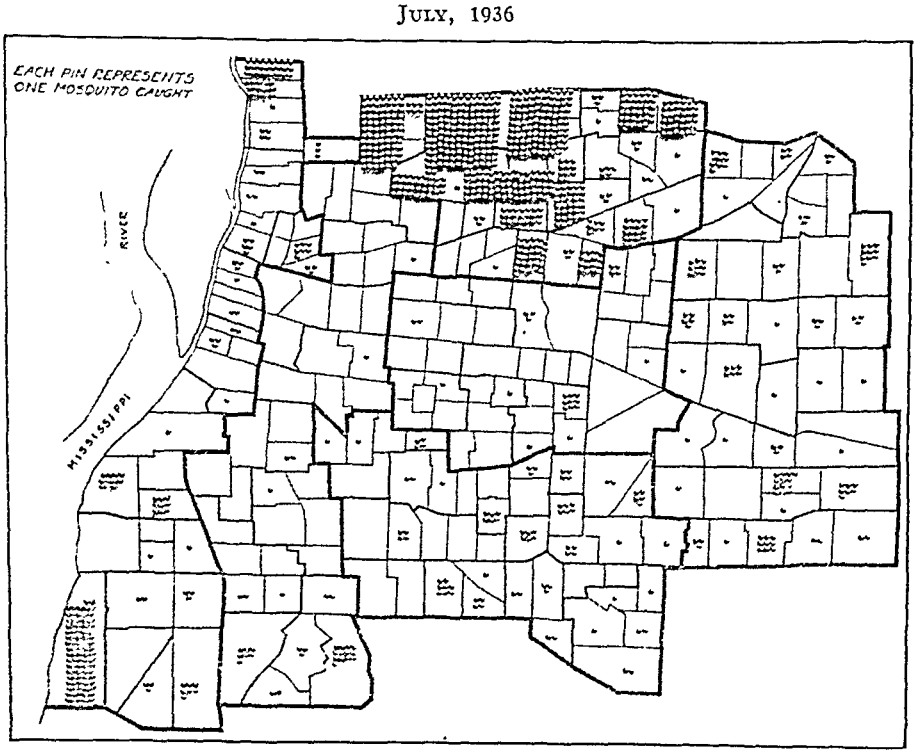
The city was divided, for this study, into 6 areas as shown by Chart II.



Special emphasis was placed on attempting to show a correlation between malaria transmission in certain sections of Memphis and the presence of the female *Anopheles quadrimaculatus*. This phase of the survey will be briefly outlined in this discussion.

In carrying out this survey one of the studies undertaken was an attempt to take the weekly pulse of the city as to the prevalence of the female *Anopheles quadrimaculatus*. Mosquitoes were collected weekly from 240 catching stations uniformly distributed throughout the city, and catches were classified as: Culex, male and female: *Aëdes aegypti*, male and female; *Anopheles quadrimaculatus*, male and female: *Anopheles punctipennis*, male and female. Fourteen men were used. We were fortunate in having the advice and assistance of J. A. LePrince and H. A. Johnson of the U. S. Public Health Service, stationed in Memphis, in the actual selection of the stations. One regular member of the department staff identified all of the mosquitoes caught to insure accuracy.

CHART 3—DEPARTMENT OF HEALTH—CITY OF MEMPHIS
FEMALE ANOPHELES, QUADRIMACULATUS CATCHES
DIVISION OF MALARIA-MOSQUITO CONTROL
JULY, 1936



The different types of stations selected included 63 outhouses; 45 culverts; 32 underhouses; 29 garages; 20 cow and horse stables, and 7 miscellaneous places.

All stations have been visited once a week in the early mornings and if no catches were made at any station another check was made in the afternoon. If any catches were made in the morning the inspector would return in the afternoon and search for the breeding places so as to eliminate them if located in the city.

If any particular station was visited for 2 weeks and no adults were caught, the station was changed to some other point within the small area. If no mosquitoes were caught at this second station for 2 successive weeks, the station was again changed. In some areas where better stations were found while investigating a mosquito complaint, the old station was abandoned for the new one. More than 30,000 adult mosquitoes were caught in this study and the ratio of male *Anopheles quadrimaculatus* to female *Anopheles quadimaculatus* was 1 to 6.2.

The total catches of *Anopheles quadrimaculatus* females were charted by months and by areas and the July chart is reproduced as Chart III showing the typical distribution of the catches for the entire season as well as for each of the months of this season. The average catch of *Anopheles quadrimaculatus* females per station per week by areas for the period April 20 to October 1, is as follows:

Area	*Average per Station per Week*
1	1.17
2	0.29
3	1.84
4	0.15
5	0.41
6	0.18
Entire city	0.67

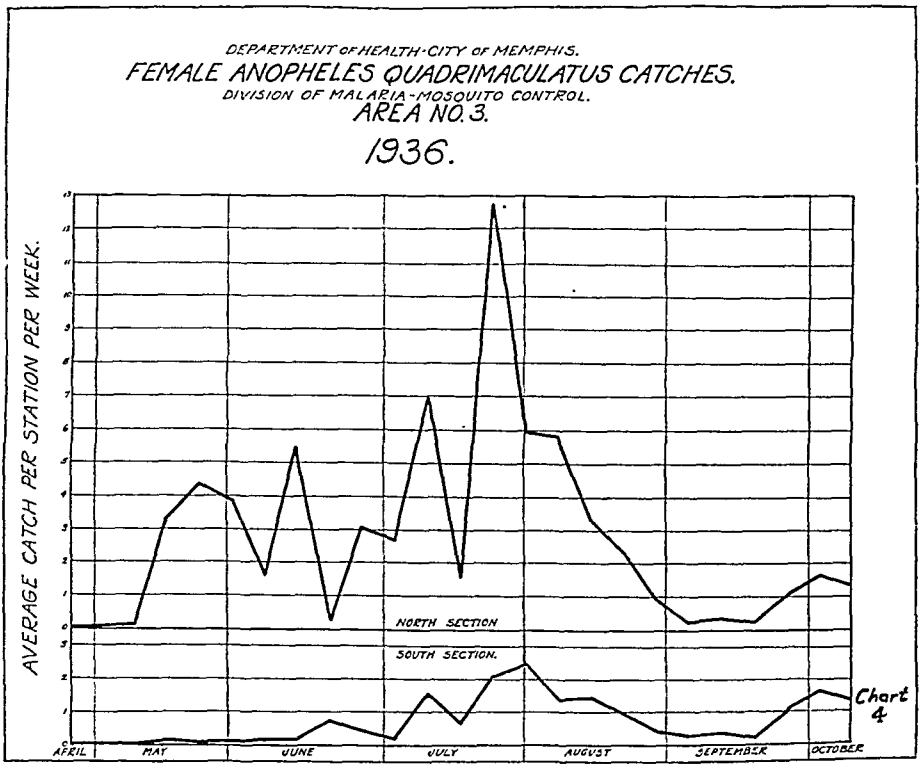
The highest number of female *Anopheles quadrimaculatus* throughout the season was caught in Area 3. In order to show more clearly the influence of out-of-the-city breeding, Chart IV shows the seasonal prevalence of the average weekly catches for the north or exposed section of Area 3 as compared to the south or protected section of Area 3.

Determining where a person probably receives his infection is difficult. A city located in the center of an endemic malarious region can have much malaria credited to it for which it is not responsible. It would seem, therefore, necessary that studies be carried on continuously from year to year to determine what percentage of the reported cases are contracted locally.

The index of the prevalence of malaria in a city like Memphis is very unsatisfactory. In many places much dependence is placed on the weekly report cards of practising physicians, and the amount of malaria reported will depend often on the energy of the local health officer in getting these report cards back. Many diagnoses are purely clinical and are as apt to be wrong as correct.

Malaria has been regarded by the public health authorities of Memphis as a major health problem and the city laboratory has been given their unqualified support in providing technicians for the diagnosis of malaria.

For the 3-year period 1933–1935, the Memphis Department of Health Laboratory examined a total of 21,837 blood specimens for malaria for Memphis residents with 4,051 positive results, or 18.5 per cent. This is an average of 7,279 specimens annually. These specimens were submitted by more than 50 per cent of the practising physicians of Memphis, and from the Memphis General Hospital and its out-patient department. From a study of these re-



ports, we are convinced that they serve as the most reliable index of the prevalence of malaria in our city.

Malaria reports are not only tabulated, but they have been investigated on field trips. All cases reported since 1922 have been visited. This is easier in a city than in the county, and it so happens that increase in malaria cases occurs in the summer when the load of other communicable diseases is at the lowest level; so it is not necessary to employ other personnel for this work.

Until 1936, much of the history taking was done by all of the generalized nurses in the department, but the reliability of the information obtained was questionable because of the difficulty of training these nurses in uniform history taking. Beginning June 1, 1936, all histories have been taken by a special nurse and an assistant who were given considerable supervision by the Epidemiologist. A special history form was used and each week-end the Epidemiologist classified the cases checked and these were charted immediately to keep the information up to date.

In a latent infectious disease like malaria, it is realized that it is impossible in many cases to determine the dates of infection, but it is thought that there is a certain degree of accuracy in stating that a person was probably infected outside the city, or in the city, when the occupation or recreational habits of the patients, as well as their home addresses are considered. Of course, considerable difficulty in reaching some patients has been encountered, as they have recovered sufficiently to be up and away from home when the nurse calls, and the informant knows very little about them. It has been found that many of them are not residents of Memphis at all, either being patients in hospitals or temporarily in the city, dates of onset preceding their arrival.

Assuming that all cases of malaria having their dates of onset prior to June 1 were recurrent cases, we have collected data on the 295 cases reported in the 4 month period, June-September. Analysis of these cases is as follows:

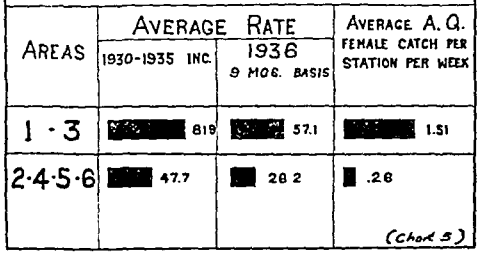
	Number	Per Cent of Total
Non-resident	46	17
Recurrent cases	65	24
Probably local infections	66	25
Probably outside infections	90	34
Total	267	100
Unsatisfactory data — unreliable or unobtainable	28	
Grand total	295 Cases	

By adding the 145 cases occurring before June 1, there has been a total of 440 cases. Of these 66, or 15 per cent, have been classified as probably local infections.

A relationship is not shown in comparing the resident infection case rate for the first 9 months of 1936 in the 6 areas. However, in comparing the average resident infection case rates for the years 1930 to 1935 with the *Anopheles quadrimaculatus* female catches for 1936 in the combined Areas 1 and 3, which are the areas immediately adjacent to Wolf River and the Islands and bottomlands bordering the river, with Areas 2, 4, 5, and 6, which are the protected areas of the city, a relationship is shown in Chart V. In comparing the average resident infection case rates for the first 9 months of 1936 with the female *Anopheles quadrimaculatus* catches for 1936, in the two exposed Areas 1 and 3 with the 4 protected Areas 2, 4, 5, and 6, a relationship is also shown in Chart V.

In Areas 2, 4, 5, and 6, where only 0.2 *Anopheles quadrimaculatus* mosquitoes were found per station per visit, malaria transmission must have been at a minimum. It is known that the exact prevalence of the different types of mosquitoes cannot be determined through catching stations even though there were approximately 5 stations to each square mile. A comparatively small proportion, possibly 1 out of 2,000 *Anopheles quadrimaculatus* females will become infected and able to transmit malaria.

GRAPH SHOWING RELATION BY AREAS BETWEEN AVERAGE MALARIA CASE RATES AND AVERAGE ANOPHELES QUAD. FEMALE CATCHES



It is thought that by controlling this area outside the city at approximately a 30 per cent increase in the present mosquito control cost, the rate for Areas 1 and 3 should be cut almost in half and possibly this decrease will have a tendency to reduce the case rate in Areas 2, 4, 5, and 6.

It is probable, however, that even perfect malaria mosquito control work for the city would not reduce the total cases of malaria reported by more than approximately 10 per cent, and there would always be some cases that would be classified as resident infection.

It is believed that the above data are as reliable as it is possible to obtain with a protean disease like malaria. Its main value will be in furnishing the sanitary engineer with comparable data from year to year in order that control methods may be checked with the variability of malaria prevalence.

SUMMARY

1. For the past 16 years Memphis has carried on an Anopheles mosquito control program under the direction of sanitary engineers

selected because of previous experience in malaria-mosquito control work.

2. Malaria-mosquito control work is carried on in the Mississippi River Delta malaria belt without a coördinated plan, and the results are not as effective as is possible.

3. Delaware is doing extensive mosquito control work using CCC camps.

4. A Works Program Administration malaria survey project was approved and a study made.

5. Certain data were secured as to prevalence and distribution of female *Anopheles quadrimaculatus*.

6. All malaria cases from June 1 to October 1 were visited and were classified as to source of infection.

7. A relationship seems to be shown between two areas of the city immediately adjacent to Wolf River and 4 protected areas when compared to female *Anopheles quadrimaculatus* and resident infection case rates for 1936.

8. The results of this study indicate that a 30 per cent increase in the yearly cost of malaria control work in Memphis to include breeding areas adjacent to the city would possibly result in a 10 per cent reduction in the cases of malaria reported in Memphis.

9. Further results in reducing malaria cases reported in Memphis will depend on the malaria control activities in the Mississippi River Valley endemic area in which Memphis is located.

10. It is felt that a coördinating agency is needed for promotional and educational work in addition to the research work now carried on in the Mississippi River endemic malaria area in order to secure maximum results in the malaria control activities in this area.

ACKNOWLEDGMENTS—The authors wish to acknowledge the efficient work of W. H. Grisham who directed the malaria-mosquito study in the field, and of Dudley Ball who assisted in interviewing cases and in tabulating the results. The charts included in this article were made by Marvin F. Carter of the Memphis Health Department.

Negro Health Week

THE nation-wide Negro Health Week activities are conducted under the auspices of the National Negro Health Week Committee, U. S. Public Health Service. Dr. Roscoe C. Brown of the United States Public Health Service is chairman of the committee.

Dr. Brown's report shows that 30 states, and over 2,500 communities, representing every section of the country from Maine to Texas, and from Maryland to California, participated in the 1936 health week activities (March 29–April 4).

Over 65,000 schools, households, or communities took part in the clean-up campaigns; over 35,000 in the insect and rat control projects; more than 8,000 sanitary toilets were installed; and over 20,000 plant and flower projects were carried on. There were 264 radio talks given, and the educational exercises were attended by over 418,000 persons.

The New York State Program for the Control of Pneumococcus Pneumonia*

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PNEUMONIA is third highest among all causes of death in the United States; it is third highest in Canada and in New York State. There is no populous part of the North American Continent in which it is not a prevalent and serious disease. That the active participation of public health agencies in the field of pneumonia control is a matter of comparatively recent development might seem surprising were it not that the means for so doing have not been generally recognized, though they have existed for some time. Moreover, there have been 2 clinical concepts, almost axiomatic, which unquestionably have served to retard progress; namely, that the survival or death of a pneumonia patient could be influenced very little by whatever skill the physician had to offer and that pneumonia as a cause of death was of importance only to the infant, about which nothing could be done, and to the aged, about which there was little inclination to attempt to do anything.

Today neither of these concepts is held true since we now possess established means of treating pneumonia and recognize that a large proportion, about 75 per cent, of deaths from this cause occur before the age of 65, consequently during a time of life of either actual or potential economic importance (Figure I).

There exist two avenues of approach to the control of any communicable disease, the preventive and the therapeutic. Unfortunately, so far as pneumonia is concerned the application of preventive measures is limited by our inadequate knowledge of its epidemiology. With respect to therapy, however, we are more fortunate. Through the researches of Cole and his coworkers, of Wadsworth, Park, Bullowa, Cecil, Felton, Kirkbride, Sutliff and Finland, and others,[1] the application of specific serum therapy to pneumococcus pneumonia has been developed to a high degree.

To illustrate the potential value of serum therapy as a control measure a theoretical consideration of its application to the problem in New York State may prove helpful. Such a consideration must be confined to so-called "lobar pneumonia," since sufficient data relative to pneumonia as a whole are lacking.

There are, in round numbers, 3,000 deaths annually from lobar pneumonia in New York State, indicating about 12,000 cases. If the average experience of the past with respect to the incidence

* Read at a Joint Session of the American Association of School Physicians and the Health Officers and Public Health Nursing Sections of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 22, 1936.

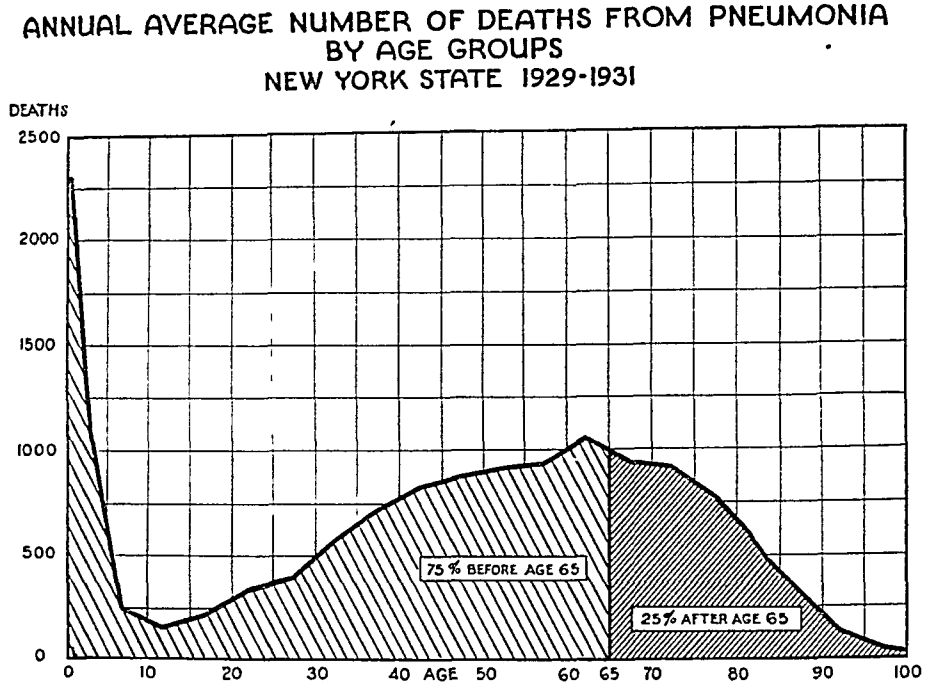


FIGURE I

of the various types of pneumococci within this group continues, 65 per cent of these cases should be due to pneumococci of Types I. II, V, VII, and VIII (Figure II). For all of these, effective specific antiserum, in limited quantities, is available.

Assuming that the fatality rates for each type, as ascertained from the large experience reported in the literature, remain fairly constant for untreated and also for cases adequately treated with serum, a rough estimate of the number of deaths expected for the series either with or without serum treatment may be separately obtained (Figure III).

From Figure III, it may be seen that the universal and reasonably adequate application of serum treatment might be expected to produce a 46 per cent reduction in deaths from lobar pneumonia. This does not take into consideration the possible application of serum treatment in bronchopneumonia, of which a certain proportion of cases are undoubtedly caused by pneumococci of types also amenable to it. Though universal or even adequate use of serum on a wide scale is most unlikely of attainment, such an analysis, despite its highly theoretical nature, serves to show that this avenue of approach is potentially capable of significant effect. In fact, a degree of success far short of the estimate given would still have to be considered worth the effort involved.

There are other aspects of therapy

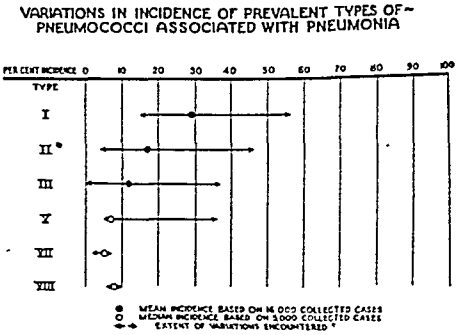


FIGURE II

which are generally considered capable of influencing the outcome of pneumonia. Outstanding among these is nursing care, discussed in another part of this paper.

The history of the interest of public health agencies in pneumonia control appears to be one of rather logical evolution. As far back as 1911, in New York City where the use of antipneumococcus serum had its birth in this country, the Bureau of Laboratories of the Department of Health of the City of New York, commenced the production and limited distribution of a polyvalent antipneumococcus serum made from strains of pneumococci prevalent at that time. In 1915 the Division of Laboratories and Research of the New York State Department of Health first undertook the general distribution of type specific antipneumococcus serum through its system of laboratory supply stations,[2] and in 1917, sputum typing was added to the list of procedures for which qualification of approved public health laboratories rendering such services was required.[3] In 1917 the Massachusetts Department of Health also undertook the production and distribution of antipneumococcus serum.[4] In spite of the availability of such serum in these areas the demand for its use outside of certain clinics apparently was not large. There are probably several reasons for this, important among them being the difficulty attending the administration of unconcentrated serum and the high percentage of severe serum sickness which followed its use.

In 1920, Cole[5] stressed the importance of considering pneumonia as a communicable disease, indicated the responsibility of public health authori-

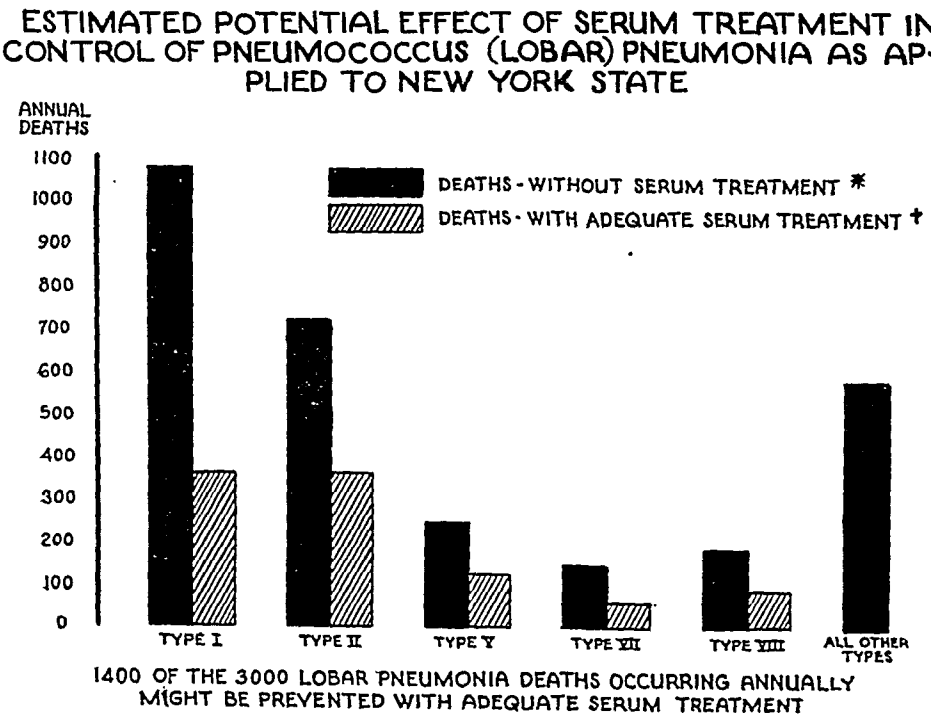


FIGURE III

* Case fatality rates for cases not serum treated estimated as follows: Type I, 30%; II, 40%; III, 50%; V, 30%; VII, 25%; VIII, 20%.

† Case fatality rates for serum treated cases estimated as follows: Type I, 10%; II, 20%; V, 15%; VII, 10%; VIII, 10%.

ties resulting therefrom, and emphasized the need of general education concerning pneumonia and its mode of spread.

In 1931, Bigelow, with the coöperation of the Commonwealth Fund of New York City, instituted an intensive 5 year pneumonia study in Massachusetts.[6] This study has now been completed with substantial success. During the past few years, interest in the problem of pneumonia control has also been indicated in other areas. In the cities of Detroit,[7] New York, and New Haven, and the states of Connecticut, Maine, Michigan and Vermont, definite plans variously directed toward this end are being formulated or are in actual operation.

Despite the gradual growth of interest in pneumonia control over 25 years, it would be grossly unfair to the outstanding demonstration recently completed in Massachusetts and to the notable work of Heffron, White, and others in this connection, not to give due credit to that study for the leading part it has played in the broadening concept of public health responsibility in this field.

Coincidental developments also of great importance in intensifying interest in the wide application of serum therapy have been further refinements in the methods of serum concentration and the popularization of the "Neufeld method" of sputum typing which has made very rapid and accurate bacteriological diagnosis possible.[8]

The adequate application of serum therapy to a problem of this sort necessitates the institution of means for producing or purchasing serum for free distribution to those unable to afford it: the provision of readily available and reliable service for the bacteriological diagnosis of pneumonia specimens; the development of informational service within the medical profession to assure an understanding of the value of serum treatment, of the technic of administration, and the necessity for early treatment.

Assuming that these provisions can be made, there remains the difficult task of educating the general public, a task created by the common tendency of the layman to put off medical consultation even in the face of such an obvious illness as pneumonia.

The development of an effective nursing service presents a problem too complex to permit complete consideration here. Usually hospitalization is desirable, but for various reasons it may be impossible and occasionally unwise to attempt it. Those cases which are treated at home frequently could benefit from the services which a skilled nurse has to offer. Nurses undertaking this type of work must be thoroughly prepared for it. The widest spread of the available staff over the territory it has to cover must be carefully planned. Areas totally lacking facilities for such service must be individually dealt with. Finally, the service that is available must be properly "sold" both to the medical profession and the lay public for, strange though it may seem, a service of this kind often remains unrecognized or is but slowly accepted.

The New York State pneumonia control program in its present form was instituted November 1, 1935, as a coöperative undertaking, combining the activities of the State Department of Health, the State Medical Society, the State Association of Public Health Laboratories, the Metropolitan Life Insurance Company, and the Commonwealth Fund, the last 2 rendering financial assistance.[9]

The administrative responsibility for the entire program was undertaken by Dr. Thomas Parran, then Commissioner of Health. To assist in this, the Commissioner appointed an Advisory Committee on Pneumonia Control comprised of 12 physicians, including representa-

tives of the sponsoring organizations and recognized authorities on pneumonia. In addition, a unit designated as the Bureau of Pneumonia Control, was organized in the Division of Communicable Diseases under the general supervision of Dr. George H. Ramsey, Assistant Commissioner for Preventable Diseases.

To appreciate fully the problem as applied to New York State, it is desirable to outline the general scheme of central and local public health organization as well as the functions of the various divisions of the State Department of Health concerned with the pneumonia control program.

New York State, exclusive of New York City, has an area of 47,355 square miles and a population of 5,930,864 according to the estimate of July 1, 1935. The state is divided into 16 health districts, each having a full-time district health officer, who, with the assistance of a suitable staff, is responsible for all local health activities within his district, including the supervision of local health officers. The cities of Buffalo and Rochester are not included in territory under the jurisdiction of district health officers but are subject to the authority of the State Commissioner of Health.

There are 5 full-time county departments of health in the state which are under the general supervision of the district health officers, but whose commissioners may report certain phases of their work directly to the State Commissioner of Health.

The State Department of Health is composed of 11 divisions, of which the

PLAN OF ADMINISTRATIVE ORGANIZATION

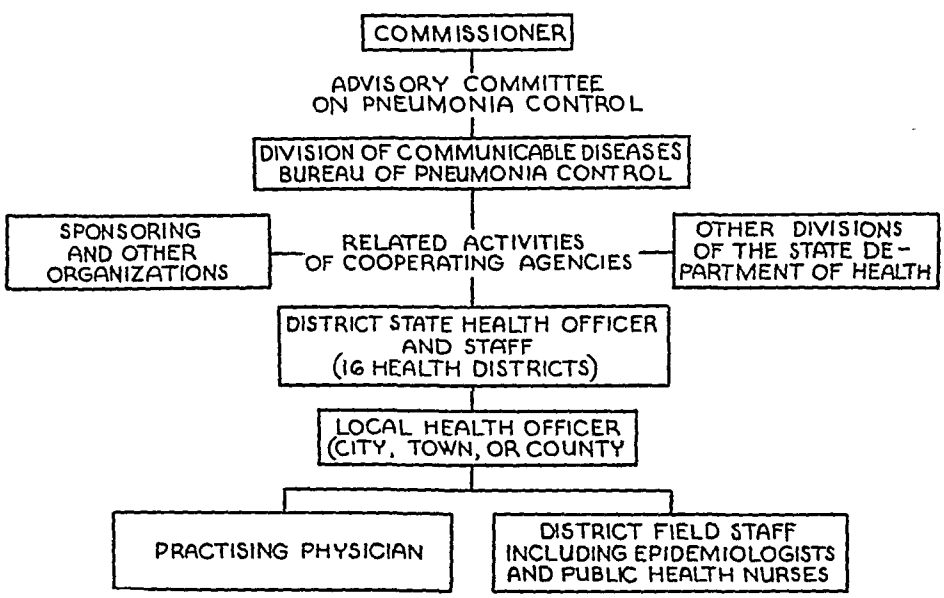


FIGURE IV

* The average incidence of Type II is unquestionably influenced (raised) by the failure of many authors, prior to 1929, to differentiate between typical and atypical Type II strains.

† In indicating the extent of variations encountered only reported series of 100 cases or over have been included.

Divisions of Communicable Diseases, Laboratories and Research, Public Health Nursing, Public Health Education, Maternity, Infancy and Child Hygiene, and Vital Statistics are concerned in varying degree with pneumonia control activities.

The relationship of these various units with respect to the pneumonia control program is shown in Figure IV.

It is the function of the Bureau of Pneumonia Control to coördinate the activities of the various divisions of the Department of Health in so far as they are related to this field; to exercise general supervision over the related activities of coöperating organizations; to constitute the source of qualified medical and scientific opinion on the subject of pneumonia within the department, and to conduct appropriate research studies in the field of epidemiology and administrative methods.

In addition to containing the Bureau of Pneumonia Control, the Division of Communicable Diseases participates actively as the direct source of contact with the various district health officers through whom situations peculiar to certain localities are dealt with, case reports are obtained, and local investigations and special case studies are carried out.

All pneumonia case reports * received by the Division of Communicable Diseases are checked for accuracy and for proper allocation. Incomplete reports are followed up. The district health officer is responsible for noting on each case report received by him the result of the laboratory examination, if done, and for submitting the same to the Central Office where a file of all current pneumonia cases is maintained. Further, these reports are kept corrected with the death certificates received by the Division of Vital Statistics. Significant data on the sevaral thousand such reports received annually are kept readily available through the use of the punch card system.

The statisticians of the Bureau of Pneumonia Control also maintain, in so far as feasible, current data on the results of specific serum therapy, control case studies, and other special investigations.

While it has been unnecessary to set up a special unit within the Division of Laboratories and Research, the staff of the Central Laboratory has been increased in order to meet the demand for greater serum production, for the expansion of typing facilities, and for the undertaking of special research studies.

The Division of Laboratories and Research is producing concentrated and refined antipneumococcus serum for Type I only. Type II antiserum, however, will be available early in 1937, and serum for other types will be developed as rapidly as circumstances permit. This serum is distributed through 105 laboratory supply stations, which are frequently, but not always, associated with a diagnostic laboratory or centrally located hospital.

The system under which the various official and private diagnostic laboratories operate has been described elsewhere.[3] All such laboratories granted the approval of the State Department of Health are held to rigid standards and are subject to constant supervision with respect to the procedures for which approval is given. There are 98 diagnostic laboratories throughout the state which have the approval of the New York State Department of Health for pneumococcus type differentiation. In addition there are 7 so-called "preliminary typing stations" maintained in outlying districts too small to support an approved laboratory but operating under the supervision of the direc-

* The reporting of pneumonia is required by law.

tor of a nearby approved laboratory. The distribution of these 105 stations is such that typing service is available within a reasonable distance of practically all parts of the state excluding the sparsely settled Adirondack and Catskill Mountain areas.

The nursing care of pneumonia has seemed to constitute, under certain circumstances, a definite public health responsibility. While perhaps we lack scientific proof that skilled nursing care is essential, one cannot lightly disregard the weight of authoritative clinical opinion which places a high value upon such care. Accordingly, the Division of Public Health Nursing has undertaken a farsighted program in which it has enlisted the coöperation of the New York State Nurses' Association and a number of other influential organizations active in this field.

The primary purpose of this is to provide facilities for the adequate bedside care of pneumonia patients who cannot be hospitalized or otherwise given trained nursing attendance. This means continuous bedside care when possible. Lacking facilities for this, public health and visiting nurses are being urged to make 2 visits daily during the critical illness. These visits should be for the combined purpose of bedside care and demonstration and should, if possible, be at least 8 hours apart.

In many localities where neither of these types of service is available because of insufficient personnel, the grades of care given vary from 1 demonstration visit to 1 daily demonstration and bedside visit. Every effort is made to get a trained nurse into the home of each known case not otherwise properly provided for. Such visits are made only with the consent of the physician.

The attempt to provide the highest possible type of nursing care and adequate family instruction carries with it the responsibility for the graduate education of nurses in this type of work. This need is being met through the combined efforts of the State Nurses' Association, the League of Nursing Education, and the Association of Public Health Nurses. Appropriate educational work is being conducted through district institutes on pneumonia, through articles in the nursing journals, through departmental literature, and through the several training schools in the state. The responsibility of the public health or visiting nurse in providing one of the most effective means of carrying sound health information into the home is recognized, and efforts are also being made to create interest and provide suitable instruction in this respect.

Earlier in this discussion the importance of a graduate educational or informational program was mentioned in relation to the need for professional recognition of the value of serum, an understanding of the technic of serum therapy, and an appreciation of the necessity for early diagnosis. As important as this is, it has been the strict policy of the Bureau of Pneumonia Control to participate in this field only upon the request of the State Medical Society and then not as a bureau of the State Department of Health but as the agent of the Medical Society. This policy has resulted, in part, in the foundation of an unusually effective spirit of coöperation between the State Department of Health and the State Medical Society. Its effect has been most clearly reflected in the attitude of the physicians who welcome the pneumonia program with enthusiasm since they realize that they not only play a vital part in it as individuals but also that their interests as an organized body are being properly guarded.

The educational program within the medical profession has been developed under the direct auspices of the Com-

mittee on Public Health and Medical Education of the State Medical Society. This committee is influential and active and has for many years assumed the responsibility for graduate study courses in the state, so that the inclusion of pneumonia as a subject for emphasis involves no new procedure.

Working through the relationship described, every available means of reaching the physician is being brought into play, including the utilization of such channels as the *New York State Journal of Medicine*, special literature on pneumonia, scientific pneumonia programs at county medical society meetings, graduate extension courses, and educational exhibits.

The participation of certain other organizations rendering advisory, financial, and other forms of assistance has been mentioned. In addition to these, the interest of numerous influential lay organizations, such as the Tuberculosis and Public Health Committee of the State Charities Aid Association, the Federation of Women's Clubs, the Federation of Home Bureaus, 4-H Clubs, etc., provides means for developing effective general educational programs which should be fully utilized.

Obviously, the subject of publicity and lay education is of outstanding importance. It has not been discussed in its entirety purely because it has seemed undesirable to separate it from the several fields of activity already considered, but it is none the less vital.

In New York State, the educational program represents, in its administrative sense, the combined enterprise of the Bureau of Pneumonia Control, the Division of Public Health Education, the Public Relations Bureau of the State Medical Society, and the Metropolitan Life Insurance Company. In this effort, every available channel is being developed, including the press, radio, departmental literature, lectures, study courses, visual exhibits, and the motion picture. The principal emphasis in all of these is placed upon the early recognition of the first symptoms of pneumonia and the extreme importance of prompt medical care.

Another highly significant field of activity that has not been touched upon is research. The unusual opportunity afforded to contribute to the knowledge of the epidemiology of pneumonia certainly should be utilized and the development of more effective clinical and administrative methods of control should be studied. The organization of the New York State program includes facilities for epidemiological studies and has been planned to be sufficiently flexible to permit the undertaking of other significant types of investigation as occasion may arise.

In conclusion, it should be pointed out that since it has been the purpose of this paper, first, to indicate the need for pneumonia control, and second, to describe an organization planned for this purpose, all reference to results has been avoided. Obviously, to attempt to evaluate a program such as this at the end of a year's experience would be premature. It should be understood that no ground exists for knowing how effective the organization herein described will prove, save that it has been carefully fashioned in the light of a large experience in public health work. Further, an attempt has been made, through close contact with others who have had experience in similar fields, particularly the Massachusetts pneumonia study, to profit both by advice and by example, and thereby to adapt to the pattern and the needs peculiar to the State of New York a pneumonia control program which is both comprehensive and rational.

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AMONG PAPERS TO BE PUBLISHED IN MARCH

Engineering Aspects of Malaria Control by State Health Departments

GEORGE H. HAZLEHURST

Epidemiological Studies in Influenza

THOMAS FRANCIS, JR., M.D.

Observations on the Use of Copper and Chloramines in Water Purification

A. E. GRIFFIN

Standards for Determining the Suitability of Bile Specimens for Detection or Release of Typhoid Carriers

F. C. FORSBECK, M.D., AND HARRIETT C. HOLLON

Protective Antibodies in the Blood Serum of Individuals After Immunization With Typhoid Vaccine*

THE LABORATORY STAFF, ARMY MEDICAL SCHOOL
UNDER THE SUPERVISION OF J. F. SILER, M.D.

Colonel, Medical Corps, U. S. Army; Director, Army Medical School, Washington, D. C.

DURING the past 2 years the technical staff of the Army Medical School has been engaged in a somewhat comprehensive investigation of 7 specially selected strains of the typhoid organism, the purpose in view being to determine whether it might be practicable to enhance still further the protective properties of the typhoid vaccine used in the prevention of typhoid fever in military personnel.

At the last Annual Meeting of the American Public Health Association a brief report was presented outlining the results obtained in 2 phases of the investigation, namely: (1) a determination of the properties, as to virulence, of selected strains of the typhoid organism, and (2) the immunogenic properties of the strains subjected to experiment.

RESULTS OBTAINED IN VIRULENCE TESTS

In these experiments ordinary white mice were used for test purposes and, briefly, the results obtained were as follows:

When white mice were segregated into large groups and inoculated intraperitoneally with live organisms of the 7 strains, in gradually increasing concentrations and under like conditions, it was found that, from the viewpoint of virulence, the seven strains fell into 2 definite groups, one of low virulence and the other of high virulence. In the group of strains—4 in number—showing low virulence, an average lethal dose (a.l.d.) of approximately 400 million live organisms was required to kill 50 per cent of the animals inoculated within a period of 72 hours. The strain used routinely in the manufacture of typhoid vaccine at the Army Medical School (Rawlings, intermediate) and stabilized smooth and rough variants of that strain fell in the group of low virulence.

Three of the strains, including 1 freshly isolated from a chronic carrier of many years' standing, living on the

* Read before the Laboratory Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936. Published by permission of the Surgeon General who is not responsible for the opinions expressed therein.

NOTE: Since preparation of this report the Surgeon General, U. S. Army, has approved the substitution of Strain No. 58 (Panama Carrier Strain) for that now being used in the preparation of vaccine for the Army. Production of vaccine from this strain is now being undertaken as a matter of routine. It is anticipated that distribution of the new vaccine to the Army and other Governmental Departments will be undertaken in the early part of 1937.

Isthmus of Panama (designated in our records as Strain No. 58), 1 isolated from the blood of an individual with clinical symptoms of great severity, and the Rawlings strain rejuvenated by Bensted, proved to be highly virulent for white mice. Fifty per cent of the mice in each group subjected to experiment succumbed, within 72 hours, to a dosage of from approximately 75 to 100 million live organisms.

CROSS-IMMUNITY TESTS

In the cross-immunity experiments, groups of mice protected with vaccines made from highly virulent organisms were protected to a much higher degree than were groups protected with vaccines prepared from strains of low virulence.

Of the virulent strains used, the one giving the most satisfactory, all round results, from the viewpoint of cross-immunity, was Strain No. 58 (*supra*).

The findings were reported at the Annual Meeting of the American Public Health Association last year.

CONCENTRATION OF PROTECTIVE BODIES IN THE BLOOD SERUM OF VACCINATED INDIVIDUALS

The next most important line of investigation appeared to us to be to develop, if practicable, a method of measuring the concentration of protective substances in the blood serum of vaccinated individuals. Up to this time, the most commonly used method of measurement has been the titration of agglutinins. It is a well known fact that the titer of agglutinins in the blood serum of vaccinated individuals does increase after vaccination. However, it also is well known that there is considerable variation in the titer of the various agglutinins in different individuals, that the peak of agglutinin production usually is attained within about 30 days after completion of vaccination, and that thereafter it generally falls rapidly. While the presence of agglutinins in the blood stream of vaccinated individuals indicates some degree of immunity, it cannot be said that the absence of agglutinins indicates lack of immunity. This method of measurement, for the reasons outlined above and for other reasons, is concededly unsatisfactory.

Consideration, therefore, was given to the question as to whether it might be practicable to develop a method of measuring the concentration of protective antibodies to typhoid fever analogous in principle to the so-called mouse protection test now in use for the determination of protection to yellow fever.

Preliminary to investigating this possibility, it was desirable that some means be secured for increasing the virulence for mice of live typhoid organisms in which the minimum lethal dose for normal mice would be materially lower than that we had demonstrated to be the case when the live organisms are suspended in Ringer's solution.

In the cross-immunity tests reported last year [1] Ringer's solution was used as a diluting agent and the dosage used to determine the degree of protection in vaccinated mice was 16 to 32 times the dose required to kill 50 per cent of normal mice. With such large doses of organisms (virulent strains 75 to 1,200 million, avirulent strains 400 to 12,800 million), the mice were overwhelmed with foreign protein before the body mechanism involved in resistance and immunity could be brought into play. The result was that the information obtained with such overwhelming doses could not be properly interpreted, particularly in the case of avirulent strains of the typhoid bacillus where enormous doses of live organisms of necessity were required to kill normal mice.

We were aware of the investigative work of Nungester *et al.*,[2] and of Miller,[3] of Chicago, in which they had demonstrated that the virulence of certain bacteria can be greatly enhanced by suspending the inoculum in mucin, and, theoretically, we assumed that such a technic might be applicable to the typhoid organism.

Fortunately, at about this time, we learned that Dr. G. W. Rake[4] of the Rockefeller Institute, had completed some investigations along these lines in which had been included virulent strains of the typhoid bacillus. Briefly, he had found that if 6 per cent mucin be added to a suspension of virulent, live culture, and young Swiss mice used as the test animal, the m.l.d. ranged from 10 to 1,000 organisms. In Ringer's solution alone approximately 75 to 100 million live organisms were required to kill 50 per cent (a.l.d.) of a given number of Swiss mice. Furthermore, he had found that the blood serum of an individual immunized with typhoid vaccine contained protective antibodies for mice against typhoid infection. When he injected 0.2 c.c. of the serum intraperitoneally into Swiss mice and then, within ½ hour, gave them, also by intraperitoneal inoculation, multiples of the m.l.d.—even up to 100,000 virulent live typhoid bacilli suspended in mucin—all the mice survived.

Dr. Rake offered to spend a few days with us for the purpose of reviewing the investigations made by him, explaining the technic adopted, and offering suggestions in the formulation of plans of procedure for our investigations. Dr. Simon Flexner, Director, Rockefeller Institute, very kindly authorized the visit and we are greatly indebted to Dr. Rake for the help and coöperation given us.

Briefly, the plan of procedure adopted for the investigations to determine the degree of concentration of protective substances in the blood serum of individuals protected by the use of typhoid vaccine was as follows:

1. Individuals who gave a negative history of typhoid fever and who had never been immunized with typhoid vaccine were selected for the administration of the experimental vaccines.

2. All salient data were recorded on individual cards.

3. Approximately 25 c.c. of blood was withdrawn, serum separated under aseptic conditions, and stored without preservative or inactivation.

4. The first dose of vaccine was administered. The experimental vaccine used had been prepared from 2 strains of the organism, one, No. 58 (Panama Carrier Strain) representing the virulent type of organism, and the other, No. 1-I (the strain used for immunizing military personnel since the inception of this protective measure) representative of strains of low virulence. Two types of vaccine were prepared from each strain, one being a heat killed (56° C. for 1 hour) vaccine to which 0.25 per cent of tricresol was added as a preservative; the other a formalinized (0.1 per cent) vaccine. For the purpose of comparing the protective potency of these vaccines the volunteers were divided into 4 groups, each group being given 1 of the 4 types of vaccine described above. Three subcutaneous doses of each of the vaccines were given in the usual manner, the doses consisting of 500 million, 1,000 million, and 1,000 million organisms, respectively, the interval between doses being 1 week.

5. Two weeks after the administration of the third dose of the vaccine, approximately 25 c.c. of blood was again withdrawn from each individual and the serum separated, and preserved under aspectic conditions without inactivation.

6. Some difficulties were encountered in the selection and procurement of mice of a type best adapted to the protection tests contemplated. The ordinary white mice used in our virulence and cross-immunity tests did not succumb to small doses of virulent typhoid organisms (10 to 1,000) suspended in mucin. As a rule the m.l.d. for such mice was about 25 to 50 thousand organisms. White Swiss mice, averaging 16 to 18 gm. in weight, were suitable but not available in the quantities required. We then carried out preliminary virulence experiments with a pure genetic strain of black mice (C. 57) developed by Dr. C. C. Little of the Jackson Memorial

Laboratory, Bar Harbor, Maine. These were found to be satisfactory in all respects. Mice of this type were used for all mouse-protection tests, their weight, when subjected to experiment, ranging from approximately 16 to 18 gm. About 13,500 such mice were used in the mouse-protection experiments reported in this communication.

The procedure followed in testing for protective substances in the blood serum of vaccinated individuals was as follows:

A. PRELIMINARY TITRATION

One-tenth c.c. of blood serum obtained from individuals *before* vaccination was injected intraperitoneally into a group of 4 mice. Within ½ hour this was followed by intraperitoneal inoculation of a suspension in 6 per cent mucin of 10,000 living organisms of a virulent strain of the typhoid bacillus (No. 58). The cultures were grown on our regular agar medium and were 12 hours old at the time of their use. Controls were run for each test. For this preliminary titration we chose arbitrarily 10,000 living organisms as the dose, assuming that if all the mice died when such a small dose was used it could be taken for granted that the blood serum injected contained but few if any specific protective substances. The observation period for mice treated in this manner was 72 hours and if within that period all mice succumbed we assumed that the individual from whom the serum was obtained was *not immune* to typhoid fever.

B. TITRATION TO DETERMINE CONCENTRATION OF PROTECTIVE SUBSTANCES

In carrying out these experiments the blood serum obtained 2 weeks subsequent to the completion of vaccination was used, the amount being a constant factor, namely, 0.1 c.c. (the same as for the preliminary titrations).

In these titrations 3 strains of the typhoid organism were used. Two of these, 1 virulent (No. 58) and 1 avirulent (No. 1-I), had been used in the preparation of the experimental vaccines, described previously. The 3rd strain (No. 63), which was of the virulent type with "smooth" characteristics, had been recently isolated from a fatal case of typhoid fever occurring at Fort Sam Houston, Tex. It was introduced for the purpose of determining whether or not the vaccines used were capable of producing specific substances in the blood of vaccinated individuals that would protect against heterologous strains of the typhoid organism occurring under natural conditions. The blood sera from all vaccinated individuals were titrated against all the 3 strains referred to above.

The procedure followed in the final titration was the same as that adopted in the preliminary titrations, except that 3 concentrations of live organisms each injected into 4 mice were used, and the procedure repeated for each of the 3 strains, namely, 58, 63 and 1-I. The concentrations used for 58 and 63 were 1, 10, and 100 million, while it was necessary to use 100 million, 1 billion, 2 billion, and, in some instances, 4 billion of the 1-I strain. The organisms were inoculated intraperitoneally within ½ hour subsequent to inoculation of the sera.

So far, titrations have been made of the sera of 277 individuals inoculated with the 4 types of vaccines referred to above. Controls consisting of normal mice inoculated with lethal doses of suspensions of the organisms used in the titration tests were carried out in all instances.

Of the blood sera of 210 individuals subjected to titration both before and after vaccination, 78 (37.2 per cent) fell in the class which we arbitrarily designate as "non-immunes," that is to say, when 0.1 c.c. of blood serum of such individuals, withdrawn before vaccination, was injected intraperitoneally

TABLE I

TITRATION OF BLOOD SERA OF INDIVIDUALS PROTECTED BY PREVIOUS VACCINATION WITH HEAT-KILLED TRICRESOLIZED VACCINE PREPARED WITH TYPHOID STRAIN NO. 58

a. Strain Used for Test Purposes: No. 58 Homologous						*b. Strain Used for Test Purposes: No. 63 Heterologous*					
Serial No. Individual from Whom Serum Was Collected	*Per Cent of Mice Protected Against Doses of 1, 10, and 100 Million Living Organisms*				*M.l.d. Controls: 10, 100, and 1,000 Living Organisms*	*Serial No. Individual from Whom Serum Was Collected*	*Per Cent of Mice Protected Against Doses of 1, 10, and 100 Million Living Organisms*				*M.l.d. Controls: 10, 100. and 1,000 Living Organisms*
	1 Mill.	*10 Mill.*	*100 Mill.*	*Average, All Doses*			*1 Mill.*	*10 Mill.*	*100 Mill.*	*Average, All Doses*	
1	100	100	66	89	1,000	6	100	100	0	67	1,000
2	100	66	0	55	1,000	8	100	100	0	67	100
4	66	0	0	22	100	10	100	100	0	67	100
6	100	50	0	50	10	11	100	100	0	67	100
8	100	100	0	67	1,000	12	100	100	0	67	100
10	100	100	100	100	1,000	13	100	100	0	67	100
11	100	100	0	67	1,000	16	100	75	0	58	10
12	100	100	0	67	1,000	17	100	75	0	58	10
13	100	100	50	83	1,000	36	100	100	75	91	1,000
16	100	100	0	67	10	41	100	100	100	100	1,000
17	100	100	25	75	10	42	100	100	50	83	1,000
36	100	100	0	67	100	43	100	100	50	83	1,000
41	100	100	50	83	100	44	100	100	0	67	1,000
42	100	100	25	75	100	45	100	50	0	50	100
43	100	100	75	92	100	46	100	50	0	50	100
44	100	100	0	67	1,000	47	75	25	0	33	100
45	100	100	0	67	1,000	135	100	50	0	50	10
46	100	100	25	75	1,000	141	100	100	50	83	100
47	100	100	0	67	1,000	161	75	100	0	58	100
135	100	50	0	50	100	242	100	75	0	58	100
141	100	100	50	83	100	243	100	75	0	58	100
161	100	100	0	67	10	247	100	50	0	50	100
242	100	25	0	42	10	250	100	50	0	50	100
243	100	50	0	50	10						
247	100	0	0	33	10						
250	100	25	0	42	10						
Av. Total	98	79	18	65		Av. Total	98	81	14	64	
Total Average:	65					Total Average:	64				

into a pure genetic strain of black mice (C. 57) and followed within ½ hour by the intraperitoneal inoculation of mucin suspensions of 10,000 living typhoid organisms of a virulent strain (No. 58), *all mice died* within a period of 72 hours.

Of the 210 sera subjected to preliminary titration: in 68 (32.5 per cent) instances 75 per cent of the mice succumbed, in 35 (16.7 per cent) instances 50 per cent of the mice died, in 11 (5.2 per cent) instances 25 per cent, and in 18 (8.6 per cent) instances none died, following intraperitoneal inoculation of 10,000 living virulent organisms.

The results obtained have been assembled and analyzed on a basis of the 5 groups just indicated. As this report is a preliminary one and necessarily must be brief we shall confine ourselves to a presentation and discussion of the findings in the group of individuals which, arbitrarily, we have chosen to designate as "non-immunes." Suffice it to say, in this connection, that the results obtained in the other 4 groups parallel, in general, those obtained in the non-immune group.

As has been pointed out, when one uses avirulent strains to titrate, by animal test, the blood sera of immunized individuals, enormous doses of the bacilli must be used; the animal is overwhelmed with toxic substances before its defensive mechanism can be brought into play. Therefore, it is not

TABLE II

TITRATION OF BLOOD SERA OF INDIVIDUALS PROTECTED BY PREVIOUS VACCINATION WITH FORMALINIZED VACCINE PREPARED WITH TYPHOID STRAIN NO. 58

Serial No. Individual from Whom Serum Was Collected	*a. Strain Used for Test Purposes: No. 58 Homologous* — *Per Cent of Mice Protected Against Doses of 1, 10, and 100 Million Living Organisms*				*M.l.d. Controls: 10, 100, and 1,000 Living Organisms*	*b. Strain Used for Test Purposes: No. 63 Heterologous* — *Per Cent of Mice Protected Against Doses of 1, 10, and 100 Million Living Organisms*				*M.l.d. Controls: 10, 100, and 1,000 Living Organisms*	
	1 Mill.	*10 Mill.*	*100 Mill.*	*Average, All Doses*		*1 Mill.*	*10 Mill.*	*100 Mill.*	*Average, All Doses*		
18	100	100	0	67	10	100	75	0	58	10	
20	100	100	0	67	10	100	25	0	42	100	
21	50	0	0	17	10	100	100	25	75	100	
30	100	100	0	67	10	100	100	0	67	100	
49	100	100	25	75	100	100	100	0	67	100	
50	100	100	0	67	100	100	100	100	100	1,000	
51	100	100	100	100	100	100	100	50	83	100	
55	100	100	75	92	10	100	100	75	92	100	
57	100	100	0	67	100	100	100	100	100	100	
58	100	100	0	67	100	107	100	100	100	100	
60	100	100	100	100	100	170	100	100	0	67	10
107	100	100	75	92	1,000	235	100	50	0	50	100
170	100	50	0	50	10	239	100	50	0	50	100
235	100	0	0	33	10	272	100	100	0	67	100
239	100	25	0	42	10	276	100	25	0	42	100
272	100	50	0	50	10	277	100	100	0	67	10
276	100	50	0	50	10						
277	100	100	0	67	10						
Av. Total	97	76	21	65		Av. Total	100	83	28	70	
Total Average:	65					Total Average:	70				

TABLE III

TITRATION OF BLOOD SERA OF INDIVIDUALS PROTECTED BY PREVIOUS VACCINATION WITH HEAT-KILLED TRICRESOLIZED VACCINE PREPARED WITH TYPHOID STRAIN NO. I-I

Serial No. Individual from Whom Serum Was Collected	*a. Strain Used for Test Purposes: No. 58 Homologous* — *Per Cent of Mice Protected Against Doses of 1, 10, and 100 Million Living Organisms*				*M.l.d. Controls: 10, 100, and 1,000 Living Organisms*	*b. Strain Used for Test Purposes: No. 63 Heterologous* — *Per Cent of Mice Protected Against Doses of 1, 10, and 100 Million Living Organisms*				*M.l.d. Controls: 10, 100, and 1,000 Living Organisms*	
	1 Mill.	*10 Mill.*	*100 Mill.*	*Average, All Doses*		*1 Mill.*	*10 Mill.*	*100 Mill.*	*Average, All Doses*		
66	75	25	0	33	100	100	75	0	58	1,000	
67	75	0	0	25	100	100	25	0	42	1,000	
69	100	50	0	50	100	100	75	0	58	1,000	
70	100	100	25	75	100	100	100	50	83	1,000	
71	75	50	0	42	1,000	100	75	0	58	1,000	
72	100	25	0	42	1,000	100	25	0	42	1,000	
76	100	50	0	50	1.000	50	0	0	17	100	
82	100	0	0	33	100	100	50	0	50	10	
112	100	100	25	75	100	100	75	75	83	100	
137	100	0	0	33	1,000	100	100	0	67	100	
152	50	0	0	17	1,000	0	0	0	0	10	
178	75	0	0	25	10	100	100	0	67	10	
185	100	25	0	42	10	100	0	0	33	100	
186	100	50	0	50	10	75	50	0	42	100	
188	100	0	0	33	10	100	75	0	58	10	
208	0	0	0	0	10	0	0	0	0	100	
209	0	0	0	0	10	25	0	0	8	100	
215	75	0	0	25	10	100	0	0	33	100	
253	50	0	0	17	10	75	0	0	25	100	
255	25	0	0	8	10	25	0	0	8	10	
Av. Total	75	24	3	34		Av. Total	78	41	6	42	
Total Average:	34					Total Average:	42				

TABLE IV

TITRATION OF SERA OF INDIVIDUALS PROTECTED BY PREVIOUS VACCINATION WITH FORMALINIZED VACCINE PREPARED WITH TYPHOID STRAIN NO. 1-I

a. Strain Used for Test Purposes: No. 58 Homologous

Serial No. Individual from Whom Serum Was Collected	Per Cent of Mice Protected Against Doses of 1, 10, and 100 Million Living Organisms: 1 Mill.	10 Mill.	100 Mill.	Average, All Doses	M.l.d. Controls: 10, 100, and 1,000 Living Organisms
31	100	100	0	67	10
33	100	100	0	67	100
90	100	75	0	58	100
91	100	75	0	58	10
95	75	25	0	33	10
125	75	0	0	25	100
138	100	50	0	50	100
194	25	0	0	8	1,000
220	0	0	0	0	10
221	75	0	0	25	10
223	100	0	0	33	10
224	0	0	0	0	10
226	25	0	0	.8	10
280	100	100	0	67	10
Av. Total	70	37	0	36	

Total Average: 36

b. Strain Used for Test Purposes: No. 63 Heterologous

Serial No. Individual from Whom Serum Was Collected	Per Cent of Mice Protected Against Doses of 1, 10, and 100 Million Living Organisms: 1 Mill.	10 Mill.	100 Mill.	Average, All Doses	M.l.d. Controls: 10, 100, and 1,000 Living Organisms
31	100	75	0	58	100
33	25	0	0	8	100
90	100	100	0	67	100
91	100	100	50	83	1,000
95	100	50	25	58	1,000
125	100	75	0	58	100
138	100	75	25	67	100
194	0	0	0	0	10
220	0	0	0	0	100
221	100	0	0	33	100
223	100	25	0	42	100
224	100	0	0	33	100
226	75	0	0	25	10
280	100	100	0	67	10
Av. Total	79	43	7	43	

Total Average: 43

practicable to evaluate the results of such work. For this reason the presentation of data and their discussion will be confined to an analysis of the results when the tests were made with 2 different living virulent strains of the typhoid organism (58 and 63) suspended in mucin.

The data have been tabulated to show the survival rate (degree of passive immunity) existing in groups of mice inoculated with sera from selected immunized individuals whose sera prior to vaccination failed to protect groups of mice against a dose of 10,000 living typhoid organisms of a virulent strain (No. 58).

The protective properties of the sera obtained from individuals after immunization with each type of vaccine are indicated in detail in Tables I and IV, inclusive, and are further summarized in Table V.

DISCUSSION

The principal purpose of the investigation undertaken by us has been to determine whether it may be practicable to enhance still further the protective properties of the typhoid vaccine administered to Army personnel.

In analyzing the results obtained and evaluating their significance, we wish to *reëmphasize* the fact that the blood sera *prior* to *vaccination* of all individuals included in the data analyzed in this report *failed to protect* mice when 10,000 living virulent typhoid organisms (Strain No. 58) were inoculated intraperitoneally within ½ hour subsequent to injection of the serum.

We shall consider specifically the protective qualities of the sera of individuals protected with a vaccine prepared from a strain of high virulence (No. 58) as compared with the sera from individuals immunized with the strain of low virulence [(No. 1-I) used in the preparation of vaccine for the Army], using 2 strains of virulent typhoid bacilli for titration purposes.

Considering first those individuals to

whom heat killed, tricresolized vaccines were administered, we find that the sera of individuals vaccinated with No. 58 vaccine protected mice (passive immunity) to a much greater degree in all concentrations than did the sera of those immunized with No. 1-I vaccine when titrated against No. 58.

When doses of 1, 10, and 100 million live organisms of Strain No. 58 were used for titrations in mice the survival rate (passive immunity) in the group receiving sera from Strain No. 58 vaccinated individuals exceeded that of the group given sera from No. 1-I vaccinated individuals by 23, 55, and 15 per cent, respectively.

Theoretically, the protection conferred on mice by sera of individuals previously vaccinated with No. 58 vaccine, under the conditions just outlined, should show a higher protection rate, as the test organism used for titration was the same as that used for the antecedent vaccination of the individuals. However, the influence of this factor can be eliminated by analysis of the results obtained when sera of both types were titrated against organism No. 63. Here again the degree of protection given by sera from individuals vaccinated with No. 58 is much higher than from those protected with No. 1-I vaccine. In this instance the superiority of the sera from No. 58 vaccinated individuals—expressed as percentages—

TABLE V

STATISTICAL STUDY SHOWING THE COMPARATIVE DEGREE OF PASSIVE IMMUNITY CONFERRED ON MICE BY 0.1 C.C OF IMMUNE SERA OBTAINED FROM HUMANS IMMUNIZED WITH THE DIFFERENT TEST VACCINES[1]

	Percentage Surviving When Tested with the Dosage and Against the Strains Shown Below, and the Significance of the Difference in the Degree of Protection Conferred by the Different Test Vaccines					
	1 Million		*10 Million*		*100 Million*	
	58	63	58	63	58	63
58 HT[2] vaccinated sera (per cent survival)	98	98	79	81	18	14
1-I HT vaccinated sera (per cent survival)	75	78	24	41	3	6
Difference in percentage surviving	23	20	55	40	15	8
Probable error of difference	6.7	9.7	8.35	9.2	5.7	6.1
Significance of difference in multiples of P.E.[3]	3.42	2.06	6.58	4.35	2.63	1.31
Odds that findings not due to chance alone	47 to 1	15 to 1	350,000 to 1	300 to 1	12 to 1	1.6 to 1
58 F[4] vaccinated sera (per cent survival)	97	100	76	83	21	28
1-I F vaccinated sera (per cent survival)	70	79	37	43	00	7
Difference in percentage surviving	27	21	39	40	21	21
Probable error of difference	8.7	7.5	11.0	10.9	6.7	8.8
Significance of difference in multiples of P.E.	3.1	2.8	3.55	3.68	3.14	2.4
Odds that findings not due to chance alone	26 to 1	16 to 1	60 to 1	75 to 1	28 to 1	8.48 to 1
58 HT vaccinated sera (per cent survival)	98	98	79	81	18	14
58 F vaccinated sera (per cent survival)	97	100	76	83	21	28
Difference in percentage surviving	1	2	3	2	3	14
Probable error of difference			Difference not significant			
Significance of difference in multiples of P.E.			Difference not significant			
Odds that findings not due to chance alone			Difference not significant			
1-I F vaccinated sera (per cent survival)	70	79	37	43	00	7
1-I HT vaccinated sera (per cent survival)	75	78	24	41	3	6
Difference in percentage surviving	5	1	13	2	3	1
Probable error of difference			Difference not significant			
Significance of difference in multiples of P.E.			Difference not significant			
Odds that findings not due to chance alone			Difference not significant			

1. The serum obtained prior to vaccination from each person failed to protect mice against 10,000 virulent organisms (Strain No. 58)
2. Heat tricresolized
3. Probable error
4. Formalinized

was 20, 40, and 8 per cent, respectively, when 1, 10, and 100 million test organisms were used.

Taking up next a comparison of the protective properties of the sera from individuals previously vaccinated with formalinized vaccines (No. 58 or No. 1-I) and titrated in mice against the same strains, in the same dosages as were discussed in the preceding paragraph, the results were essentially the same. The percentage differences in this instance, in favor of No. 58 vaccine, when 1, 10, and 100 million organisms were used for titration, were as follows:

Organism No. 58 used for titration—27, 39 and 21 per cent.

Organism No. 63 used for titration—21, 40 and 21 per cent.

Other analyses of a similar nature are presented in Table V, and all show essentially the same results.

In considering the test lethal doses of live organisms, 10 million organisms seem to give the most clear-cut distinction between the amount of protection afforded by the vaccine tested. The dose of 1 million seems to be too low to give sharp differentiation, while the dose of 100 million approaches the direct toxic limit of the test organisms. Analysis of the data on protection against 10 million live organisms shows that sera from individuals vaccinated with the No. 58 heat killed, tricresolized vaccine gave 55 per cent better protection against the homologous strain (No. 58) and 40 per cent better protection against the heterologous strain (No. 63) than did the sera from individuals vaccinated with the No. 1-I heat killed, tricresolized vaccine. In the case of the sera from No. 58 formalinized vaccinated individuals, the difference when compared with the No. 1-I formalinized vaccinated individuals was 39 per cent better protection against No. 58 and 40 per cent against No. 63.

Based on experimental evidence available there may be justification for the assumption that the use of heat in the preparation of vaccines may either completely or partially denature the antigens present. It has been suggested that such antigens will be adversely affected to a less degree if certain chemical substances are used as killing agents. Of the chemical agents suggested for this purpose formalin, presumably, has given satisfactory results and is widely used.

Heat killed and formalin killed vaccines were prepared from the 2 strains subjected to experiment (No. 58 and No. 1-I), and administered alternately to volunteers. In Table V we have analyzed the results obtained. A study of this table indicates that the protective substances present in the sera of individuals immunized with the 2 types of vaccine show no significant differences.

It also will be noted (Table V) that we have analyzed the data included in this communication from the viewpoint of determining the statistical significance of the results obtained. It is recognized that as the number of sera analyzed in this report is limited to 78 cases, the results shown by an analysis of this character is subject to acceptance with reservation. However, the experiments throughout have given consistently uniform and clear-cut results and this serves to counterbalance in some degree the paucity in numbers.

Bearing in mind this reservation, it may be stated that statistical analysis of the data shows that the results are significant. This amply supports the conclusion arrived at by analyses from other points of view, namely, that the blood sera of individuals immunized with vaccines prepared from cultures of typhoid Strain No. 58 confer a materially higher degree of passive immunity to mice than do the blood sera of individuals immunized with vaccines prepared from the typhoid strain now

being used in the manufacture of vaccine for the Army (No. 1-I).

These results are in conformity with those obtained in the studies on active immunization of mice as previously reported.

Mouse protection experiments paralleling those reported in this communication are being continued for the purpose of accumulating a greater mass of data for analytical and other purposes.

In this connection it may be stated that a report in detail of all investigations covering strains of the typhoid organisms undertaken by the writers during the past 2 years is now in preparation, and it is anticipated that it will be completed and published within the next 4 to 6 months.

CONCLUSIONS

The findings in virulence tests, cross-immunity experiments in mice, and mouse protection tests, reported in this and a previous communication suggest strongly that 2 important criteria useful in the selection of a strain of the typhoid organism for the preparation of vaccine for immunization against typhoid fever are the following:

1. The strain of the organism should be a highly virulent one.
2. The strain should be a highly immunogenic one, as demonstrated by active and passive immunity tests in a selected breed of mice.

We appreciate the fact that these conclusions are based on experimental evidence secured through mouse tests. Nevertheless it is our opinion that they are sufficiently clear-cut, particularly the mouse protection tests, to justify their application to man. Their validity must, of necessity, rest on the degree of protection afforded human beings by the use of a vaccine prepared from a strain or strains of organisms with the properties we have indicated above.

It is our intention to recommend to the Surgeon General of the Army that hereafter typhoid strain No. 58 (which fulfils our mouse experimental requirements) be employed for the preparation of vaccine for administration to Army personnel. If this recommendation be adopted the validity of these conclusions, in all probability, can be demonstrated or disproven within a period of 3 to 5 years. In the meantime we are and shall continue subjecting strains from many sources to experimental studies of the general nature outlined in this report.

ACKNOWLEDGMENTS

We desire, at this time, to express our appreciation, in general terms, to many scientific workers for the aid, encouragement and coöperation extended us throughout this investigation, reserving for the more extended final report specific expressions of our sense of obligation. However, at this time, we wish to make of record our very great appreciation of the very essential coöperation given us by the students of the sophomore classes (1935) of the Medical and Dental Schools of Georgetown University and the Medical School, George Washington University. Dr. Earl B. McKinley, Colonel E. B. Vedder, and Dr. Leland W. Parr, of George Washington University, and Dr. Mario Mollari, of Georgetown University, had knowledge of the scope of the investigation being undertaken by our group and presented the matter to the above mentioned classes of students. As a result these medical students volunteered to take the different types of vaccines used in the mouse protection tests and to furnish us with adequate quantities of blood for use in these experiments. Of the 277 bloods subjected to test 180 were supplied by the above mentioned students. Without this essential coöperation the investigative work would have been very greatly delayed.

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Rôle of the Health Department in the Prevention of Accidents*

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SOME of you who improve your leisure hours by reading the classics will recall the verses written by one Emmeline Grangerford, discovered by one Huckleberry Finn and embodied in his memoirs.[1] They are as follows:

Ode to Stephen Dowling Bots, Dec'd.

And did young Stephen sicken,
And did young Stephen die?
And did the sad hearts thicken,
And did the mourners cry?

No, such was not the fate of
Young Stephen Dowling Bots;
Though sad hearts round him thickened,
'Twas not from sickness' shots.

No whooping cough did rack his frame,
Nor measles drear with spots;
Not these impaired the sacred name
Of Stephen Dowling Bots.

Despised love struck not with woe
That head of curly knots,
Nor stomach troubles laid him low,
Young Stephen Dowling Bots.

O, no. Then list with tearful eye,
Whilst I his fate do tell.
His soul did from this cold world fly
By falling down a well.

They got him out and emptied him;
Alas, it was too late;
His spirit was gone for to sport aloft
In the realms of the good and great.

There are several items worthy of note in this bit of verse, written presumably about 100 years ago.

In the first place it recorded the name of the decedent and the cause of death and although it fails to state categorically whether accidental, suicidal, or homicidal, the context clearly indicates an accident. One could criticise it further for its failure to state the age in exact terms or the place of death. But considering the time and the general locale one is quite safe in believing that it probably constituted the best record existent that such a person as Stephen Dowling Bots was ever born.

Next one should note the implication that death from measles, whooping cough or stomach trouble would be in line with current experience. Just why this child should be expected to die of unrequited love I am not prepared to say. One might guess that it referred to tuberculosis since that was a common cause of the "decline" which so many young people of the mating age "went into."

First aid consisted of "emptying" him. One feels quite certain that artificial respiration was not attempted since Miss Grangerford would surely have mentioned it, had it been tried. Most important of all is that Stephen Dowling Bots, dying from an accident, was quite as dead as though it had been yellow fever or measles, whooping cough, gastroenteritis, or some other infection of childhood which caused his demise.

* Read before the Vital Statistics Section of the American Public Health Association, at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

It has seemed to me that this last point is one which we health workers have failed to give the consideration its importance deserves, although there is some encouragement in the fact that three recent papers have called the matter to our attention.[2, 3, 4] What is the net gain if a child, through breast feeding and pasteurized milk, is prevented from dying of gastroenteritis if he pulls a stewpan of boiling water off the stove and is fatally scalded? What use to protect him against diphtheria to be killed by an automobile?

We have made notable advances in the past quarter century in reducing the death rates of infectious diseases, particularly in the younger age groups. At the cost of hundreds of millions of dollars for the construction and operation of water supply systems, millions for the safeguarding of milk, hundreds of thousands for the discovery and control of typhoid carriers, the typhoid fever death rate in the United States Registration Area has been reduced in the past 25 years. While it is true that there have been concomitant benefits that exceed the decline in typhoid in importance, it is interesting to note the difference in actual number of deaths from typhoid in 1910 as compared with 1934 in New York State.[5] In 1910 there were 1,374; in 1934 there were 86—a difference of 1,288. In 1910 there were 2,433 deaths from diphtheria; in 1934 there were 134—a difference of 2,299. These are regarded as the two outstanding triumphs in the field of public health in the past 20–25 years, since they have almost eliminated in certain states, at least, two diseases tending to exhibit themselves in dramatic epidemics. Yet the number of deaths from accidents during this period increased 2,127—nearly twice the saving in typhoid fever, and nearly equal to the saving in diphtheria.

Fortunately, in tuberculosis, diarrhea and enteritis, and pneumonia there have been other savings, grossing larger although lacking in the appeal peculiar to diseases which frequently manifest themselves in epidemics.

What impresses me, however, is that few, if any, health officers or health departments are displaying any interest in the prevention of injury and death from accident. They are content that the statistics shall be tabulated and published, leaving prevention entirely to other agencies or to the will of God. I believe I am correct in stating that there has never been a paper on the subject of accidents before any other section of this Association than the Vital Statistics Section. I will except from this, papers dealing with industrial accidents and some specific poisonings. There have been none to make the health officer feel any consciousness of obligation to act; none to direct his thinking along preventive lines; none to point to the need for further information of the kind that will enable him to meet the problem. We have had special luncheons on diphtheria, symposia on this or that disease, few of which diseases equal in importance accidents as a cause of monetary loss, as a cause of human suffering, as a cause of death.

What can a health department do about accidents? Let us consider them under the 4 general heads employed by the United States Census in its classification—motor vehicle, industrial, home, and public.

In state departments or bureaus charged with the duty of collecting and tabulating data with respect to motor vehicle and industrial accidents and of preventing them, the health department obviously can only act as a coöperating agency. Thus far, I think that coöperation has consisted in helping to check the completeness of death reports. We can do something more. There is an epidemiology of accidents as there is of

disease. That is, a methodology has been developed in study of disease prevention which is applicable to accident prevention. Should not health departments make this technic available to accident prevention? In large industrial organizations this technic has been developed and applied. It should be expanded to smaller ones.

This technic demands first of all reliable answers to definite questions. Certain of these questions are common to all diseases; certain others to all cases of the same disease; others relate to the particular place, the particular time or the particular individual. Intelligence in questioning, judgment in estimating the credibility of the testimony are quite as essential as proper statistical treatment of the resulting data. Reports which may be used as the basis of prosecution or suit are unlikely to be reliable as a basis for scientific investigation. This suggests that either reports on motor vehicle and industrial accidents should be confidential, or basic data should be supplemented by a detailed report that is not subject to subpoena. The latter would be enhanced in value if made by a competent investigator, one who understands the problems, the reasons for the questions, and the significance of the answers.

There are deeper causes for our automobile accidents than those commonly stressed in the reports of motor vehicle bureaus and the ensuing publicity in the press. No one needs to be told that the higher the speed the more distance it takes to stop, the more likely the accident to be fatal. Something less than a moron can understand that. Yet the emphasis is always on speed. The slow driver, the "moper," occasionally comes in for a mild reprimand but there is no law against driving 35, 20, or even 5 miles an hour on heavily traveled main highways. There is no law requiring that a car going 25 miles per hour catching up with one going 20 shall pass at the first opportunity nor that the next who catches up with this incipient procession shall pass. There are no statistics to tell us how many accidents, how many deaths have resulted from this thoughtless procession forming habit. The blame is never on the "moper." It is always on the one who "cuts in." Automobile accidents are currently classified on this basis. We do not know how many of this type are the result of "mopers," how many are the result of a legitimate but ill-timed lack of patience by some one who has some place to go and something to do when he gets there.

"Drives" for safety *per se* and against carelessness have been rather common; for "courtesy" rather rare. A public health person cannot but speculate as to the advantages of the latter appeal as compared with the former. Courtesy means manners, consideration for other people than one's self, one's family, one's immediate companions. In the days when the aristocracy was supreme in France, spitting on the floor of a salon or a dance floor was common practice, not even a *faux pas* if it came from the proper person. A generation ago it was proper to spit on the sidewalk, the aisle of a railroad car or a street car or a theatre. This was made a penal offense but the decrease in the practice has resulted less from the arrests and fines than from the general disapprobation of the public to a filthy habit. Why should we look to a certain type of taxi or truck driver for our manners in driving an automobile?

At the instigation of our motor vehicle bureaus our schools have been teaching safety to school children. The decline in recent years in the death rate at ages 5–14 from automobile accidents is taken as evidence of the success of

this instruction.[6] But the rate at ages 15–24 has gone up, and most of them are collision accidents as contrasted with the "pedestrian" accidents in the lower age group. The inference is that children are being taught how to look out for themselves when crossing a street or a road but not the essentials of safety and courtesy when they assume the responsibility of operating a car.

It has been said that the individual's psychology changes when he gets behind a wheel. He acquires a sense of power and superiority his inherent abilities deny him as a biped. The importance of the "extensor thrust" as a cause of automobile accidents has recently been brought to our attention by Yandell Henderson.[7] He shows that as a result of this reflex action, it is the driver that goes out of control, rather than the car itself. Public health education has been largely responsible for improving our spitting habits. Is it too much to hope that it can improve our driving manners, reduce the egomania of the man at the wheel, even modify a very deep-seated reflex?

It is in the field of home and public accidents, however, that I believe the health department has its greatest responsibility and opportunity. By studying individual public accidents, by plotting them on "spot" maps, discovering common hazards, influence can be brought to bear for the removal of these hazards just as influence of the health department removed the hazards of polluted water supplies — is reducing the hazard of raw milk.

With respect to home accidents the opportunity and responsibility are more direct. Deaths from this type of accident almost equal motor vehicle accidents in the country as a whole; in some states they exceed them.[6] While the death rates from automobile accidents have risen and those from industrial accidents have fallen, home accidents have remained essentially the same. They are nobody's business. Why not the health department's? Must we concern ourselves solely with disability and death due to microcosms, deficiencies in diet, or to what we call disease, though we know not its cause?

No one is in a better position than the public health nurse to note the physical hazards of the home, the personal habits that contribute to accidental death and disability. The study of home accident admissions to the Cook County Hospital showed that disorder was responsible for one-sixth of the total, for an eighth of the falls, a third of the burns.[8] The habit of using unsuitable tools or equipment such as a knife for a can-opener· a chair for a stepladder, was responsible for another tenth. Four-fifths of the accidents to children under 5 years old were attributed to an act of omission or commission by some adult. Parents are instructed in how to feed, clothe, and clean their children; in the importance of avoiding contagion; in the need for certain immunizations; in a long list of things having to do with safety from disease. It is high time that health departments take an active part directly and indirectly in the prevention of death from external causes.

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Consolidated County Expenditures for Selected Health Services

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IN connection with the Rural Health Conservation Contest conducted by the U. S. Chamber of Commerce and the American Public Health Association, enrolled counties annually submit expenditures for certain health services. These data, which include all expenditures within a county or district health unit for the services considered, are not comparable with any previously published material on the same subject. The information collected by the U. S. Public Health Service and the Rockefeller Foundation are concerned only with those health expenditures made by or through the county or district health department, but do not include funds disbursed directly by existing nonofficial health agencies or school districts. For this reason, the figures presented in this article are generally higher than those listed in *Public Health Bulletin 222*.[1]

Before presenting the data on expenditures, a few general comparisons are made between Contest counties and the eligible counties that were not entered. Table I presents a comparison of the assessed valuation and revenue receipts of 67 Contest counties with all full-time county health units in existence on December 31, 1934. In Contest counties, the rural population constitutes but 30 per cent of the total population as compared with 61 per cent in all other full-time counties. The average per capita assessed valuation is $568, and the average per capita revenue receipts $24 for all United States counties as compared with $1,380 and $71 respectively in reporting units. Accordingly, Contest counties are much more urban in character and constitute the better units from an economic standpoint.

Sixty-five counties reported information on expenditures for health programs during 1935. These units contained a population of 3,490,977 and spent in the

TABLE I

ASSESSED VALUATION AND REVENUE OF ALL ORGANIZED FULL-TIME COUNTY HEALTH UNITS IN THE UNITED STATES AS OF DECEMBER 31, 1934

	473 Full time Counties United States (Exclusive of Contest Counties)	*67 Full-time Contest Counties*
Total Population *	39,567,466	7,717,764
Rural Population *	24,213,898	2,318,646
Per Cent Rural	61.19	30.04
Assessed Valuation †	$22,496,508,000	$10,649,963,000
Average Per Capita	$568.56	$1,379.92
Revenue Receipts †	$963,258,000	$545,914,000
Average Per Capita	$24.34	$70.73

* Population figures based on 1932 Census reports
† Financial Statistics of Counties—U. S. Department of Commerce reports 1931 and 1932

TABLE II

PER CAPITA EXPENDITURES (IN CENTS) FOR HEALTH SERVICES *
BY OFFICIAL AND NONOFFICIAL AGENCIES FOR THE SAME FULL-TIME COUNTY HEALTH UNITS REPORTING FOR THE 2 YEARS 1934 AND 1935

			Per Capita Expenditures (in Cents)					
				Source of Support				
Geographic Areas	*Year*	*Number of Counties*	*Total Official*	*County and County-Towns*	*State*	*Federal*	*Nonofficial*	*Grand Total*
Northeastern	1934	4	77.9	47.6	19.5	10.8	14.5	92.4
	1935	4	81.3	47.0	21.8	12.5	12.1	93.3
Eastern	1934	15	43.7	29.5	13.4	0.8	3.5	47.3
	1935	15	49.7	33.0	14.4	2.3	3.1	52.8
Southeastern	1934	6	42.6	33.4	3.9	5.3	7.7	50.3
	1935	6	36.1	27.5	5 2	3.4	16.9	53.0
North Central	1934	3	35.9	34.5	1.2	0.2	3.5	39.4
	1935	3	47.3	39.6	1.2	6.5	4.2	51.5
South Central	1934	3	43.2	36.0	6.1	1.1	0.7	43.9
	1935	3	66.7	58.8	6.6	1.3	0.6	67.3
Western	1934	6	84.3	79.0	...	5.3	1.1	85.4
	1935	6	83.4	83.0	...	0.4	2.0	85.4
All Areas	1934	37	62.1	52.3	5.9	3.9	3.6	65.7
	1935	37	65.4	56.3	6.7	2.4	4.9	70.3

* Exclusive of hospitalization, institutional care, medical relief, garbage collection and disposal, and capital expenditures and deficits.

aggregate $2,200,914, or 63 cents per capita. Official agencies supplied 92.5 per cent of the funds, and 7.5 per cent came from other organizations. County and county-towns bore 79 per cent of the total budget or 49.6 cents per capita; the state 10 per cent, or 6.4 cents per capita, and federal agencies contributed 3.5 per cent, which is the equivalent of 2.3 cents per capita.

Thirty-seven counties reported health expenditures for the 2 years, 1934 and 1935. Table II presents per capita expenditures (in cents) according to source of support. Total expenditures ranged from the high points, 92.4 cents per capita in 1934 and 93.3 cents per capita in 1935 in the Northeastern Division, to the lower limit, 39.4 cents per capita in 1934 and 51.5 cents per capita in 1935 in the North Central Division. The average per capita expenditures for the 37 counties increased from 65.7 cents per capita in 1934 to 70.3 cents per capita in 1935. The greatest increase occurred in the South Central Division where expenditures rose from 43.9 cents per capita in 1934 to 67.3 cents per capita in 1935—an increase of 53.3 per cent. This rise in expenditure was due in the main to the institution of special programs for sanitation, malaria eradication, and rabies control, which were financed by increased local appropriations.

Total official funds for all 37 counties rose from 62.1 cents per capita in 1934 to 65.4 cents per capita in 1935, an increase of 5.3 per cent. In 1934, the Western Section had the highest official support with an average of 84.3 cents per capita, and in the following year, the Western Division also led the several sections with an average of 83.4 cents per capita. Unlike the experience with expenditures, funds from official

sources do not show general increases for all areas. Although the Northeastern, Eastern, North Central, and South Central areas reported increases in official support, the Southeastern Division dropped from 42.6 cents per capita in 1934 to 36.1 cents per capita in 1935, a decrease of 15.3 per cent, and the Western Division shows a slight decrease of 0.9 cents per capita in 1935 under 1934.

Expenditures by counties and county-towns of all sections averaged 52.3 cents per capita for 1934 and 56.3 cents per capita in 1935, an increase of 7.6 per cent for the 37 reporting units. The highest average was attained by the Western Division with amounts equal to 79.0 cents per capita in 1934 and 83.0 cents per capita in 1935. The smallest official expenditures for 1934 were made in the Eastern Division with 29.5 cents per capita, and in 1935 in the Southeastern Division with 27.5 cents per capita.

State subsidies were highest in the Northeastern Section, where they reached 19.5 cents per capita in 1934 and 21.8 cents per capita in 1935. The Western area (6 counties reporting) shows no state support. The average for the group rose from 5.9 cents per capita in 1934 to 6.7 cents per capita in 1935, an increase of 13.6 per cent.

The highest federal aid of an average of 10.8 cents per capita in 1934 and 12.5 cents per capita in 1935, was reported by the Northeastern Division. The North Central Division having an average of 0.2 cents per capita received the smallest federal support in 1934. The Western Division with an average of 0.4 cents per capita occupied the low position in 1935. The drop in federal subsidy in the Western area from approximately $52,000 to $4,000 caused the average for the 37 reporting counties to decrease from 3.9 cents per capita to 2.4 cents per capita. With the exception of the Southeastern and Western Divisions, federal aid increased in 1935 over 1934.

Average nonofficial expenditures for all reporting units rose from 3.6 cents per capita in 1934 to 4.9 cents per capita in 1935. Support from nonofficial sources was sustained best in the Northeastern Division where the average was 14.5 cents per capita in 1934 and 12.1 cents in 1935. The lowest nonofficial support was received in the South Central Division.

Table II indicates that during this 2 year period, when one agency decreased its support, the other groups increased theirs. This is best evidenced by the data for the Southeastern Division where total public funds decreased due to curtailment in local appropriations and federal grants, but nonofficial aid was increased sufficiently not alone to offset these decreases but to cause an ultimate increase of 2.7 cents per capita in the total expenditure for 1935 over 1934.

Table III gives the percentage of support for the 37 counties that was derived from different sources during 1934 and 1935. Total official support in 1934 ranged from a high of 98.8 per cent of total expenditures in the Western Division to a low of 84.3 per cent in the Northeastern Section. In 1934, the Western area continued to receive the greatest official support with 97.7 per cent of its funds coming from county and county towns, state and federal agencies, and the Southeastern Division received the lowest with but 68.1 per cent of its funds from such sources. The average for all areas increased from 90.3 per cent in 1934 to 92.5 per cent in 1935.

County and county-towns made up 74.6 per cent of the total budget in 1934 and 78.7 per cent in 1935 for the 37 reporting counties. The Western Division received the greatest support

TABLE III

PER CENT OF EXPENDITURES FOR HEALTH SERVICES * ACCORDING TO SOURCE OF SUPPORT OF THE SAME FULL-TIME COUNTY HEALTH UNITS REPORTING FOR THE 2 YEARS 1934 AND 1935

		Source of Support					
Geographic Area	Year	Total Official	County and County-Towns	State	Federal	Nonofficial	Grand Total
Northeastern	1934	84.3	51.5	21.1	11.7	15.7	100.0
	1935	87.1	50.4	23.4	13.3	12.9	100.0
Eastern	1934	92.6	62.5	28.4	1.7	7.4	100.0
	1935	94.1	62.5	27.3	4.3	5.9	100.0
Southeastern	1934	84.7	66.4	7.8	10.5	15.3	100.0
	1935	68.1	51.9	9.8	6.4	31.9	100.0
North Central	1934	91.1	87.6	3.0	0.5	8.9	100.0
	1935	91.8	76.9	2.3	12.6	8.2	100.0
South Central	1934	98.4	82.0	13.9	2.5	1.6	100.0
	1935	99.1	87.4	9.8	1.9	0.9	100.0
Western	1934	98.8	92.5		6.3	1.2	100.0
	1935	97.7	97.2		0.5	2.3	100.0
All Areas	1934	90.3	74.6	10.4	5.3	9.7	100.0
	1935	92.5	78.7	10.2	3.6	7.5	100.0

* Exclusive of hospitalization, institutional care, medical relief, garbage collection and disposal, and capital expenditures and deficits.

with 92.5 per cent of its funds in 1934 and 97.5 per cent in 1935 supplied by local governmental units. The Northeastern area had the smallest local appropriation with 51.5 per cent in 1934 and 50.4 per cent in 1935 from county and county-towns.

State support averaged 10.4 per cent of total appropriations in 1934 and 10.2 per cent in 1935 for the entire group. The Eastern Section had its highest support with 28.4 per cent of its budget coming from the state in 1934 as against 27.3 per cent in 1935. The Western Division received no state aid.

Federal subsidies averaged 5.3 per cent of total funds in 1934 and 3.6 per cent in 1935. The Northeastern Division leads all areas with 11.7 per cent of its budget in 1934 as against 13.3 per cent in 1935 coming from federal sources. In 1934, the North Central Section received the smallest support with but 0.5 per cent coming from federal sources. In 1935, however, the smallest aid was received by the Western area, with but 0.5 per cent.

Support from nonofficial agencies represented 9.7 per cent of total funds in 1934 and 7.5 per cent in 1935.

The highest percentage is found in the Northeastern area in 1934 with an average of 15.7 per cent, closely followed by the Southeastern Division with 15.3 per cent. In 1935, however, the Southeastern Division received the greater support with an average of 31.9 per cent of its budgets from nonofficial agencies.

SUMMARY

In general, units competing in the Contest are much more urban in character and are the wealthier of all the full-time county health departments.

Those counties which reported expenditures for 2 consecutive years, averaged 65.7 cents per capita in 1934 and 70.3 cents per capita in 1935, an increase of 7 per cent over 1934. Total expenditures ranged from 92.4 cents

per capita in 1934 and 93.3 cents per capita in 1935 in the Northeastern Section, to 39.4 cents per capita for 1934 and 51.5 cents per capita for 1935 in the North Central Division. The increase reported by the South Central Division was due mainly to the institution of special programs for sanitation, malaria eradication, and rabies control, which were financed by larger local appropriations.

Total official funds (county and county-towns, state and federal) averaged 62.1 cents per capita in 1934 or 90.3 per cent of all appropriations as compared with 65.4 cents per capita or 92.5 per cent in 1935.

County and county-town appropriation for the 37 units averaged 52.3 cents per capita or 74.6 per cent of total appropriation in 1934 as compared with 56.3 cents per capita or 78.7 per cent in 1935.

State subsidies were 5.9 cents per capita or 10.4 per cent of total in 1934, as compared with 6.7 cents per capita or 10.2 per cent in 1935.

Federal aid averaged 3.6 cents per capita or 9.7 per cent of total expenditures in 1934 as against 4.9 cents per capita or 7.5 per cent in 1935.

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More Nursery Schools

SINCE 1932 there has been an increase of 42 per cent in the number of nursery schools in the United States. Forty land-grant colleges and state and privately-supported universities and colleges, 13 liberal arts colleges for women, 18 teachers colleges, and 6 institutions at the junior college level are now sponsoring nursery schools.

States reporting 10 or more nursery schools are: New York 59, Massachusetts 35, California 30, Michigan 16, Illinois 14, Minnesota 14, Maryland 13, Ohio 13, and Pennsylvania 10.

A Statistical Study of Stillbirths in Hospitals*

A Preliminary Report

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THE study of stillbirths being made by the Children's Bureau † with the coöperation of the Sub-committee on Stillbirths of the American Public Health Association is now under way in 216 hospitals widely scattered over the United States. The study is directed toward carrying forward the recommendations incorporated in the report of the sub-committee which was presented to the Vital Statistics Section of the American Public Health Association by Dr. Haven Emerson, the chairman of the sub-committee, in 1935 in Milwaukee.[1] The advisory group for the study includes the members of the Sub-committee on Stillbirths, the Children's Bureau Obstetric Advisory Committee, and Dr. Halbert L. Dunn, Chief Statistician for Vital Statistics of the United States Bureau of the Census.

The purposes of the study of stillbirths in hospitals as stated in the general plan thereof are:

(1) To obtain statistical information regarding fetal and maternal conditions associated with fetal mortality in hospitals.

(2) To make possible the development of a classification of causes of stillbirth (fetal and maternal).

(3) To further the development of a special certificate for registration of stillbirths which will serve as a base for comparable statistics for the various States.

It is hoped that the study will stimulate further development of uniformity in registration laws and practices in the several states and development of nation-wide completeness in registration of stillbirths. Uniformity in law and practice and completeness of registration, it will be remembered, were recognized by the sub-committee as the first essentials for comparability of the statistics of stillbirths in the various states.

The plan of the study, developed in the late fall of 1935, was to obtain from a group of hospitals with large obstetric services, individual schedules for all stillbirths of 20 weeks or more gestation delivered in hospitals during the period of the study. The Sub-committee on Stillbirths recommended the period of 20 weeks or more gestation as desirable for nation-wide adoption. The definition of a stillborn child is that incorporated in the Rules of Statistical Prac-

* Read before the Vital Statistics Section of the American Public Health Association at the Sixty-fifth Annual Meeting, in New Orleans, La., October 23, 1936.

† The study is being made in coöperation with Ethel C. Dunham, M.D., Director, Division of Research in Child Development, U. S. Children's Bureau.

tice of the American Public Health Association:

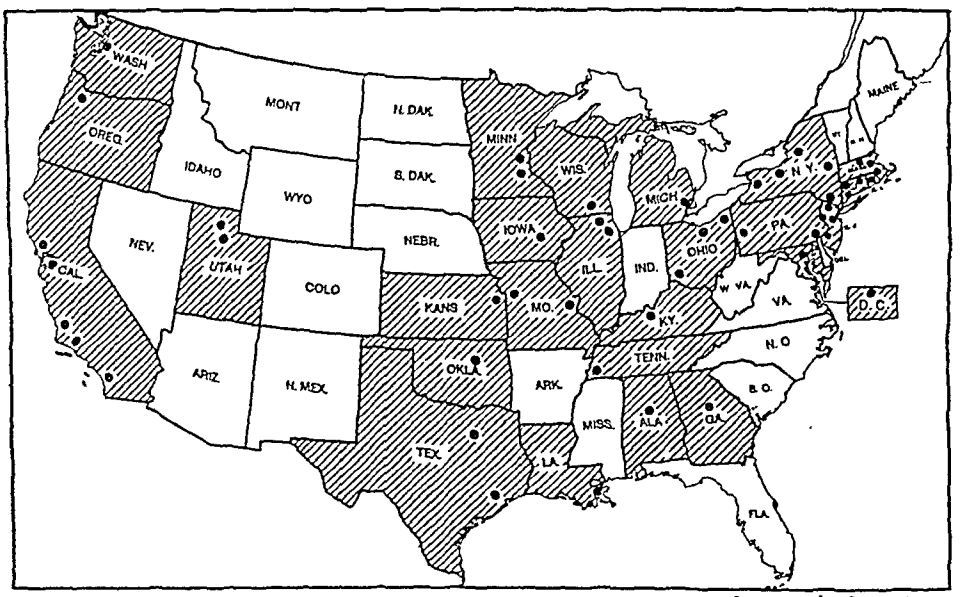
> A stillborn child is one which shows no evidence of life after complete birth (no breathing, no action of heart, no movement of voluntary muscle). Birth is considered complete when the child is altogether (head, trunk, and limbs) outside the body of the mother even if the cord is uncut and the placenta still attached. (See Rules of Statistical Practice adopted by the American Public Health Association—Rule No. 18 (18, 1908) and Rule No. 19 (19, 1908 as amended in 1913).)

The schedule is based on the preliminary special stillbirth certificate recommended by the sub-committee. It includes all the questions with respect to medical factors which appear on this preliminary certificate, and certain additional questions on items such as length and weight of fetus, complications of pregnancy, and serological test for syphilis made during the pregnancy. Most of the questions on the certificate with respect to the identity and occupation of the parents are omitted from the schedule, as they are not pertinent to this research project.

The schedule is set up on a card 8″ by 10½″. The questions all appear on the face. In so far as possible, instructions covering the questions appear directly under the questions to which they are pertinent. On the reverse of the schedule is given the basis of the study, the definition of a stillbirth, general instructions for entering information, and special detailed instructions for entering information with regard to complications of pregnancy, the causes of the stillbirth (fetal and maternal), and an example of the method of entry for a typical case.

The 216 hospitals that are coöperating in the study are located in 49 cities in 26 states and the District of Columbia. Hospitals in 3 states on the Pacific Coast, hospitals in the central states and

GEOGRAPHIC DISTRIBUTION OF STATES AND CITIES IN WHICH 216 HOSPITALS ARE COOPERATING IN THE STILLBIRTH STUDY



the middle western states—on both sides of the Mississippi—hospitals in the southern states, and hospitals in the eastern and northeastern states are coöperating. In these 216 hospitals more than 236,000 women are delivered annually. Immediately after the close of each month the hospitals send to the Children's Bureau schedules for all the stillbirths that occurred during the month. The schedules are in most instances prepared by members of the obstetrical staff of the hospitals—internes and resident physicians.

Coöperation with the hospitals was arranged through members of the medical staff of the Children's Bureau, who visited the hospitals, talked with superintendents and chief obstetricians, and went over the schedule in detail with the individual assigned by the hospital to the work on the study.

Up to October 15, the Children's Bureau had received 2,819 stillbirth schedules from the 216 hospitals coöperating. All the schedules are examined in the bureau upon receipt. When entries on a schedule are incomplete or inconsistent, it is returned to the hospital for further information. The information on the schedules is, on the whole, exceedingly well entered.

This paper presents, from the preliminary analysis of the first 1,000 schedules received, a few of the findings most pertinent to the work of vital statisticians.

With respect to general characteristics, such as race and age of mother and the relative frequency of stillbirths to primiparæ, these first 1,000 stillbirths are fairly similar to the total stillbirths registered in the United States in 1933. Of the first 1,000 stillbirths, 81 per cent were to white mothers and 19 per cent to colored mothers, as compared with 75 per cent and 25 per cent, respectively, of the total stillbirths registered in the United States. Of these first 1,000 stillbirths 30 per cent were to mothers under 25 years of age, as compared with 39 per cent of the total stillbirths registered; and 48 per cent were to mothers 25 to 34 years as compared with 40 per cent of the total stillbirths registered. Of the first 1,000 stillbirths 43 per cent were to primiparæ, as compared with 36 per cent of the total stillbirths registered; and 57 per cent were to multiparæ, as compared with 64 per cent of the stillbirths registered.

It is evident that these first 1,000 schedules show a slightly larger proportion of stillbirths to white mothers (6 per cent), a slightly larger proportion of stillbirths to mothers 25 to 34 years of age (8 per cent), and a slightly larger proportion of stillbirths to primiparæ (7 per cent), than were shown for the total stillbirths registered in the United States in 1933. These differences seem surprisingly small in view of the fact that the 1,000 stillbirths occurred in hospitals and that the 216 hospitals are all located in large cities.

With respect to period of gestation, these 1,000 stillbirths are, of course, not comparable with the total stillbirths registered in the United States, as the study has a uniform base—stillbirths of 20 weeks or more gestation—whereas there is a wide variation in the period of gestation at which registration is required in the different states. Of the first 1,000 stillbirths 18 per cent were delivered prior to the presumed period of viability (from 20 to 27 weeks gestation), 31 per cent were viable but delivered more than 1 month before term (from 28 to 35 weeks gestation), 46 per cent were delivered at term or within 4 weeks prior to term, and 5 per cent were postmature fetuses.

Time of fetal death with respect to labor was reported for 95 per cent of these first 1,000 stillbirths. Fetal death occurred prior to labor in 56 per cent of the cases and during labor in 37 per

cent; for 7 per cent either there was no labor or the time of fetal death was not reported.

Labor was reported to have been induced in 17 per cent of the cases. The relative frequency of induction was approximately the same for fetuses that died before labor and fetuses that died during labor—16 per cent and 19 per cent, respectively.

Of the first 1,000 stillborn fetuses studied, 62 per cent were delivered spontaneously and 38 per cent by operative procedure. Forceps was the most frequent type of operation (35 per cent of the operative deliveries); breech extraction was second in frequency (25 per cent); version and extraction third (14 per cent); and cesarean section fourth (12 per cent). Most of these operations for delivery were not performed until after the fetal death had occurred. In 73 per cent of the stillbirths in which the fetus was delivered by operative procedure the fetal death had occurred prior to the operation.

Information with respect to whether a serological test for syphilis had been made was reported for 95 per cent of the stillbirths. The 5 per cent for which there was no report as to whether a test for syphilis had been made included schedules marked " private case " and schedules on which it was indicated that it was not known whether such a test had been made. Of the women for whom the information was reported 69 per cent had had tests. Of the cases in which tests had been made the result was positive in 8 per cent and negative in 92 per cent. Of the women for whom the results of the test were positive, 43 per cent did not receive the test until the day of delivery or later, so that these women had had no opportunity for antisyphilitic treatment, which might have prevented the stillbirth.

In this preliminary analysis of the first 1,000 stillbirths we have been working toward the refinement of the classification of causes of stillbirth, fetal and maternal, set up by the sub-committee last year and toward the development of rules for assignment of cause mentioned as necessary in the sub-committee report. This aspect of the work is in an extremely early stage. The work toward development of rules for the assignment of primary cause when fetal and maternal causes are simultaneously certified will not be undertaken until all the data are assembled for analysis.

The preliminary work on the classification of fetal and maternal causes shows the absolute necessity for the information regarding time of fetal death with respect to labor and with respect to operation. Both of these questions appear, of course, in the special certificate for registration purposes recommended as preliminary by the sub-committee. In connection with maternal cause the preliminary work shows also the importance of the question regarding complications of pregnancy.

With respect to causes determined in the fetus: It is relatively seldom that two or more causes are determined which are of major importance. The entry, Birth Injury, is obviously not of importance when the fetal death occurred before labor. Congenital malformations are obviously more important as cause of death than birth injury that occurred in connection with the delivery of a grossly malformed fetus that died during labor. Syphilis determined in the fetus, on the other hand, can be considered the primary cause of the death of the fetus without regard to time of fetal death. Asphyxia is considered a cause of death when there is a placenta previa, or a premature separation, or other placental state or cord condition which could have affected a fetus that was alive at the time the condition obtained.

In this preliminary analysis of causes determined in the fetus syphilis was

determined in 3 per cent of the cases. Gross congenital malformation appeared as a cause in 8 per cent and birth injury in 6 per cent. Asphyxia due to placenta previa appeared in about 4 per cent of the cases. Asphyxia due to premature separation and asphyxia due to cord abnormalities each appeared in 13 per cent. A definite applicable fetal cause was reported for 53 per cent of the stillbirths. In the great majority of the cases in which no applicable fetal cause was reported on the schedule a maternal condition of importance was reported.

In the preliminary work on the analysis of maternal conditions associated with stillbirth, all the information on the schedule has been taken into consideration. The analysis of these 1,000 stillbirths shows that information (1) regarding the complications of pregnancy, (2) regarding the time of fetal death with respect to labor, and (3) to operation, is absolutely necessary in connection with the classification of maternal causes of stillbirth. For fetuses that died before labor the complications of pregnancy come in for major consideration. In the classification entitled, "Diseases of Pregnancy, Childbirth and the Puerperal State," the titles "Albuminuria and eclampsia" and "Other toxemias of pregnancy" are applicable without consideration of time of fetal death. Time of fetal death with respect to labor must be taken into consideration in connection with assignments of deaths to antepartum and intrapartum hemorrhage and also to titles that are comprised mainly of such causes as prolonged and difficult labor. Time of fetal death with respect to operation must be taken into consideration in assignment of death to titles which include operative deliveries.

The study of the maternal conditions entered on these first 1,000 schedules suggests also the desirability of greater refinement of the titles in the list set up by the sub-committee for the classification of conditions of the puerperal state and the insertion of certain additional titles, which will make the information more directly pertinent to and practicable for the study of maternal conditions associated with stillbirth. At the time of the formulation of the original classification the subcommittee looked forward to refining the list on the basis of practical experience.

In general, from this preliminary work it appears that about 15 per cent of the stillbirths studied may be assigned to nonpuerperal conditions in the mother. Of these, the most important are syphilis (7 per cent), chronic nephritis (3 per cent), diseases of the circulatory system (2 per cent), and diseases of the respiratory system (1 per cent). About 59 per cent are assignable to conditions of the puerperal state; of these 9 per cent may be assigned to albuminuria, 8 per cent to other toxemias, 16 per cent to puerperal hemorrhage (antepartum and intrapartum), and 20 per cent to accidents of childbirth. About 1 per cent are assignable to external causes, such as falls and automobile accidents. For about 25 per cent of the stillbirths no maternal condition of importance was reported.

The preliminary analysis of fetal and maternal conditions associated with these first 1,000 stillbirths shows that neither a fetal nor a maternal cause of stillbirth was entered on about 16 per cent of the schedules. This is a small percentage in view of the fact that time of fetal death has been taken into consideration in connection with the assignment and that only titles of real causal significance were included in the general plan set up by the Sub-committee on Stillbirths.

CONCLUSIONS

It is evident from the preliminary

analysis of the first 1,000 schedules that this study will bring together a body of facts with respect to factors underlying fetal death which will throw new light upon the problem of fetal and maternal mortality and contribute largely to effective efforts for the reduction of fetal losses and of maternal mortality and morbidity.

Careful critical study by obstetricians and vital statisticians of the findings from a large group of stillbirth schedules is prerequisite to the formulation of rules for the assignment of causes of stillbirth and to the determination of a workable nosology for stillbirths which will fulfil clinical and pathological requirements.

The plan of the study, the wide geographic distribution of the hospitals, and the groups associated in advisory capacity are such that the principal objectives of the study—namely, the determination of a practicable final form for the special certificate for registration of stillbirths, the development of a classification of causes of stillbirth which will show the fetal and maternal factors underlying fetal mortality, and the stimulation of uniformity in registration law and practice—appear possible of attainment.

REFERENCE

1 Stillbirths. (Report of the Sub-Committee on Stillbirths of the Committee on Accuracy of Certified Causes of Death.) *American Public Health Association Year Book, 1935–1936,* pp. 244–249.

Publications Needed

THERE is a scarcity of several numbers of the *American Journal of Public Health*—June, 1935; November, 1935; February, 1936; and July, 1936; also the *Year Book* for 1934–1935.

If any members can spare copies of these publications, the Executive Office will greatly appreciate it if they will send them in to headquarters—50 West 50 Street, New York, N. Y.

Application of Engineering Surveys to the Hatters' Fur Cutting Industry*

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ONE of the important procedures in the search for major factors in the causation of disease suspected to be of occupational origin is a detailed engineering survey of the environmental conditions associated with employment. Such surveys are not only useful in determining the origin of the disease but also serve to indicate the extent of the hazard and quite often the measures employed for its control.

The value of the preliminary engineering survey in determining the potential problems of industrial hygiene,[1] and the various engineering methods employed in an attempt to control industrial health hazards [2] were demonstrated in earlier publications in this *Journal*. The present discussion combines the technics employed in these earlier studies and applies them to a complete study of a single industry, in this instance, the hatters' fur cutting industry. It is felt that the methodology described herein can be applied, with slight modifications, to engineering surveys of other industries.

METHODS AND INSTRUMENTS USED IN THE STUDY

At the time of this study there were 36 plants in the United States engaged in the preparation of hatters' fur, employing approximately 2,000 persons. Since it was not feasible to examine every worker in the industry, it was necessary to make a selection of plants. This survey consisted of collecting such data as industrial welfare facilities afforded the workers, the general sanitation of the plant, and details concerning the processes and occupations involved in the preparation of hatters' fur. Certain other information was obtained, such as facilities for conducting physical examinations, and coöperation of employers and employees in the conduct of the study, which influenced the selection of the plants. In this manner it was possible to choose 5 plants proportionately representative of modern and old practice, as well as those which had, on visual inspection, good, fair, or poor working conditions. In addition, this preliminary survey served to give a fairly good picture of the entire industry.

Further preliminary steps prior to actual quantitation of the working environment consisted of making sanitary and occupational surveys of the various workrooms in the 5 plants. Such preliminary surveys serve as a guide for the more detailed studies which follow. The sanitary survey, for example, lists the various facilities afforded the worker in the working environment, while the

* Read at a Joint Session of the Industrial Hygiene and Public Health Engineering Sections of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

occupational survey permits one to determine the activities involved and the particular hazards associated with each occupation. Survey forms similar to those described [3] served as a basis for recording the essential data on the sanitary and occupational phases of this study.

The preliminary survey showed that the major occupational hazard in need of detailed investigation was the exposure to mercury vapor and dust. Certain occupations involving an exposure to fur dust made it advisable to obtain a particle count of this exposure also. For the determination of mercury vapor, use was made of the General Electric selenium sulphide detector.[4] This instrument was selected in preference to other devices for the detection of mercury vapor in air because of its portability, ruggedness, simplicity of operation, and the rapidity of obtaining immediate results. It has been in use for some time and has an extremely high sensitivity, there being practically no lower limit for the concentration that can be detected. In the present study, mercury dust was excluded from the detector by placing a single thickness Whatman paper thimble at the point where air enters the instrument. The dust-free air then passed into the device, was pre-heated to a temperature of 70° C., and then allowed to come in contact with a sensitized paper. The method is based on the reaction between active selenium sulphide coated on the paper, and the vapor. Whenever mercury vapor comes in contact with the paper, it is blackened, the degree of blackness being an indication of time of exposure, concentration of mercury, and other factors which can be definitely controlled. The amount of mercury vapor in the air can be determined by comparing the sample obtained with standards which accompany the instrument.

In order to determine the amount of mercury dust in the air, samples were obtained with the impinger apparatus.[5] Since it was found in preliminary observations that the mercury coated fur was of a greasy texture and hence difficult to wet, it was necessary to use a 25 per cent alcohol and water mixture as a collecting medium. Samples thus obtained were shipped to the central laboratory at Washington, where they were analyzed by the electrolytic method described by Fraser.[6] These analyses were conducted by Associate Chemist F. H. Goldman.

The Konimeter was employed for the determination of the amount of dust to which the workers were exposed.[7] In the control studies which followed, certain ventilation readings were made on the exhaust systems employed and these were obtained with the Pitot tube.

PREPARATION OF HATTERS' FUR

The processes in the manufacture of hatters' fur may be roughly considered in 3 parts: (1) the preparation of the pelt, (2) the carroting and drying of the fur, (3) the cutting or shearing of the hair from the hide. These constitute the basic steps in all hatters' fur establishments. Such differences as may be found among various plants pertain chiefly to the degree to which some departments have been mechanized.

Figure I is a flow-sheet depicting the major operations involved. Briefly, the preparation of hatters' fur consists of softening and cleaning rabbit pelts by rotating them in a drum for about 1 hour with a mixture of wet sawdust and sand. This softens the brittle pelt and cleans the fur. The next step is to remove the sawdust and sand from the pelts by rotating them in a wire mesh drum. The skins are then delivered to the openers, who mount the reversed skin on an upright wooden

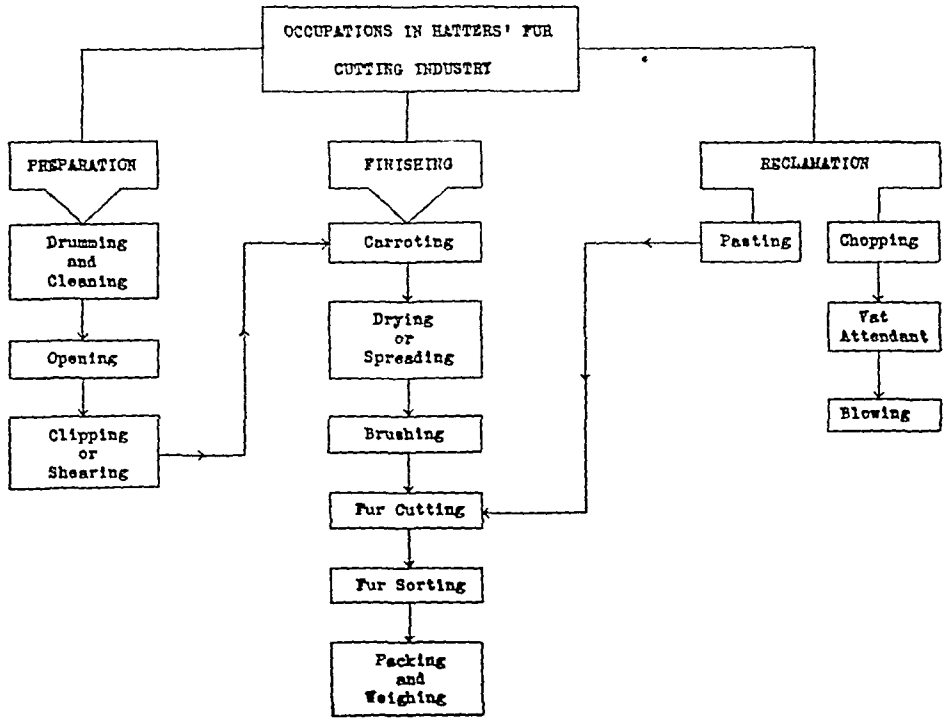


FIGURE I

fork and cut off head, tail and legs, and slit the hide. Next the long hairs are removed by a revolving cutter, designated as *clipping* or *shearing*.

Up to this point the workers have been handling raw (untreated) skins. The processes which follow are associated with the use of mercury in one form or another.

In the next operation, known as carroting, a mixture of mercury nitrate and nitric acid is applied to the tips of the fur with either a hand or revolving brush. The skins are then dried either at room temperature or slightly below 140° F. in mechanical driers (this is known as white carroting); or they are dried in ovens maintained at temperatures of approximately 240° F. (yellow carroting). After drying, the skins may be stored for several months, or sent immediately to the brushing department. After treatment with the carroting solution, the fur is matted and irregular, and must be smoothed. This is done by brushers, who take each skin and subject it to a stiff revolving brush several times. From the brushing operation the treated skin goes to the cutting department where the fur is removed from the pelt by high-speed revolving blades which shear the fur and at the same time shred the pelt. The sheared fur then passes on to a conveying belt to the sorters, who remove rough scraps of skin cut by the machine from the fur. It is then packed in paper bags, each containing 5 lbs and is now ready for the hatting departments.

In some plants certain reclamation processes are conducted. Small scraps of fur recovered in the opening or sorting operations, or purchased from furriers, are chopped into small pieces and treated in one of two ways—the pieces may be glued to strips of manila paper and from then on handled as a pelt, or

may receive vat treatment. After digestion in a vat, the scrap fur is freed of moisture in a centrifuge, then passed into a series of blowers which act as elutriators and free the fur of loose material. Other operations include storage and shipping of fur, and general maintenance and supervision.

RESULTS OF THE STUDY

PRELIMINARY SURVEYS

The majority of the 36 plants covered in the preliminary survey were in old frame buildings, many of them being establishments of the so-called "back shop" variety. Only a few were in brick buildings, and of the entire number just 2 could be considered well planned from the standpoint of control of any existing occupational hazards.

Although insanitary conditions may not be associated with ill health, it has long been recognized that the elimination of sources of uncleanliness in factories is conducive to the well-being and efficiency of the workers. For this reason, the general sanitary conditions of the 36 plants were observed, and were found on the whole rather poor. The data obtained showed that 57 per cent were in either a poor or bad state of sanitation, 33 per cent fair, and the remaining 10 per cent good or excellent.

The data in Table I indicate the number of workers in each plant, and compare such figures with other industries in the United States. They show that there was a greater percentage of larger plants in the hatters' fur cutting industry than is the case in other industries. For example, 55 per cent of the 210,959 plants covered in the 1930 United States Census employed less than 10 persons, as contrasted with only 8.4 per cent in the hatters' fur cutting establishments. In fact, 20 per cent of the 36 plants in the fur cutting industry employed 100 or more persons, as contrasted with only half that percentage for other plants in a typical industrial area. This may be due to the small number of plants in the fur cutting industry as compared with either the typical industrial area or the United States Census figures. However, it does show that the majority of these plants employed more than the average number of persons found in other trades.

A comparison of industrial welfare provision in the hatters' fur cutting industry and plants in a typical industrial area is shown in Table II. The number of plants covered in the industrial area was 615, as compared to 36 in the hatters' fur cutting trades. It is apparent that such facilities as medical care, first aid, etc., are rather limited in the latter, as compared with the plants in the typical industrial area. Only 5.5 per cent of the employees in the fur

TABLE I

COMPARISON OF PERCENTAGE DISTRIBUTION OF HATTERS' FUR CUTTING PLANTS WITH OTHER INDUSTRIAL ESTABLISHMENTS IN THE UNITED STATES ACCORDING TO NUMBER OF WORKERS

Type of Establishment	Number of Plants	Per Cent of Plants With Less Than Stated Number of Workers							
		Less than 10	Less than 20	Less than 30	Less than 40	Less than 50	Less than 75	Less than 100	100 or More
All industries in the United States *	210,959	55.0	72.0	77.0	81.2	85.2	88.8	91.9	8.1
Typical industrial Area †	615	48.7	64.1	73.4	77.0	80.7	87.0	89.8	10.2
Hatters' Fur Cutting Industry	36	8.4	27.8	38.9	52.8	63.9	69.5	80.6	19.4

* Personal communication from United States Census, 1930.
† *Pub. Health Bull. No. 216.*

TABLE II

COMPARISON OF INDUSTRIAL WELFARE PROVISIONS IN HATTERS' FUR CUTTING INDUSTRY AND INDUSTRIES IN A TYPICAL INDUSTRIAL AREA

Industry	Number of Employees	Per Cent of Persons with Listed Facility: Physician	Nurse	First Aid Room	Sickness Records	Sick Benefit Association
Hatters' Fur Cutting	1,970	5.5	10.1	21.8	10.1	10.1
Typical Industrial Area *	28,686	15.3	34.1	48.5	40.0	29.4

* *Pub. Health Bull. No. 216:* The Potential Problems of Industrial Hygiene in a Typical Industrial Area in the United States.

cutting trades had the services of either a part- or full-time physician, as compared to 15.3 per cent in the typical industrial area. When one considers that even in the typical industrial area the welfare provisions are rather limited as judged by present standards, it is evident that the hatters' fur cutting industry has much to be desired in providing these facilities.

The preliminary study disclosed that most of the employees had been in the industry 10 years or longer, and a number for more than 30 years, evidence that the industry is a stable one from the standpoint of labor turnover.

SANITARY AND OCCUPATIONAL SURVEYS

As a result of the preliminary study of the 36 plants, it was possible to select 5 factories for detailed investigation. The first step in an engineering study of this type is the making of a sanitary and occupational survey. Data pertaining to general sanitary conditions, ventilation, illumination, and environmental conditions, as well as airborne toxic materials, were recorded; while information on the various occupations and the particular activities and raw materials associated with these occupations were noted.

In the hatters' fur cutting industry

TABLE III

OCCUPATIONAL ANALYSIS OF THE HATTERS' FUR CUTTING INDUSTRY CONTRASTED WITH DATA SECURED FROM FIVE PLANTS STUDIED

Occupation	Number of Males in Industry	Number of Females in Industry	Total Number in Industry	Per cent of Total in Industry	Per Cent of Total in 5 Plants Studied
Openers	24	133	157	7.9	5.5
Drummers and cleaners	57	0	57	2.8	2.0
Skin sorters	13	11	24	1.2	0.9
Clippers	188	0	188	9.4	11.2
Carroters	180	2	182	9.1	7.3
Dryers and spreaders	52	45	97	4.8	7.0
Pilers	14	0	14	0.7	1.6
Brushers	74	26	100	5.0	4.4
Pasters and stickers	0	42	42	2.1	...
Cutters	145	2	147	7.3	8.6
Sorters	0	580	580	29.0	36.0
Packers	7	3	10	0.5	0.6
Shippers	22	0	22	1.1	2.0
General utility *	143	0	143	7.1	7.9
Blowers and choppers	135	0	135	6.7	5.0
Supervisors	60	8	68	3.4	†
Clerical	23	15	38	1.9	†
Grand Total	1,137	867	2,004	100.0	100.0

* Includes machinists, blade grinders, carpenters, elevator men, etc.
† Included in general utility

there were 14 major occupations, already briefly presented.

Table III gives the number of workers by occupation in the 36 plants and contrasts these data with similar information on the 5 plants studied in detail. It may be seen that 57 per cent of the workers were males, and that the occupation in which the greatest number of persons is employed is that of sorter—580 of the 2,004. A comparison of the last 2 columns of this table gives an indication of the representative nature of the 5 plants selected for this study. In nearly every instance the percentage of workers by occupation in the 5 plants compared well with the figures for the industry as a whole.

OCCUPATIONAL EXPOSURE TO MERCURY VAPOR AND DUST

A summary of the occupational exposure of hatters' fur workers to mercury vapor and dust in the 5 plants studied is presented in Table IV. Samples of mercury vapor and mercury dust were obtained simultaneously for each occupation and the results of the 2 separate analyses were added in order to determine the total exposure to mercury for each occupation.

One hundred and twenty-four samples of mercury vapor and dust were obtained for the study. Additional samples taken to evaluate certain other factors, such as efficiency of ventilation and a special study on the control of the mercury hazard, are omitted from this discussion. The occupations have been arranged in the order of magnitude of exposure to mercury vapor and dust, and it is quite obvious that the highest average exposure is for shippers, who are exposed to 7.2 mg. of mercury per 10 cu. m., and this high exposure may be attributed to the fact that they are employed in storerooms housing thousands of pounds of treated fur, which is constantly giving off mercury vapor.

The next highest exposure was found for pilers, who are exposed to large quantities of fur skins treated with mercuric nitrate. These skins, after treatment, are subjected to a curing process consisting merely in allowing them to age over a period of several months.

The occupation of blower entails an exposure of 4.6 mg. per 10 cu. m. due to the fact that the workers are subjected to the breathing of dust from fur which has previously been carroted. Cutting and sorting, which go hand- in-hand, involve an exposure of 4.0 mg. of mercury vapor and dust, while the lowest exposure is associated with miscellaneous occupations, involving personnel in utility activities, who are exposed to 0.6 mg. in 10 cu. m. of air. In Table IV for certain occupations 2 results are presented. The lower results were associated with processes where control measures are being practised.

In connection with the exposure to mercury vapor and dust, two interesting findings should be mentioned. The literature on mercurialism among hatters' fur workers is replete with statements concerning the severity of the hazard among carroters. The present study indicates that carroters are exposed to relatively small amounts of mercury, the findings as shown in Table IV averaging only 0.8 mg. in 10 cu. m. of air. A close study of the operations involved in carroting shows that these workers are subjected to the possible inhalation of mercury nitrate and nitric acid mist, generated during the application of the carroting solution to the fur with a hand or mechanical brush, and apparently the amount of mist is not very great. In fact, mercury in the form of vapor or dust does not begin to appear until later processes and in

those workrooms where treated furs have been stored for a considerable time. The chemical reaction which takes place subsequent to the application of mercury nitrate to raw fur, and which releases mercury vapor, is not definitely known. It is believed, however, that the reaction is somewhat as follows:

$$\text{Fur} + Hg(NO_3)_2 + HNO_3 \rightarrow \text{Keratin nitrate} + HgO.N_2O_5$$
$$\text{Fur} + O.Hg.N_2O_5 + H_2O \rightarrow Hg + \text{Fur oxide} + 2HNO_3$$
$$\text{Fur} + HNO_3 \rightarrow \text{Keratin nitrate}$$

The reaction is slow, but it is well known that more mercury vapor is given off as the carroted fur becomes older. That there is some basis for these theoretical equations is indicated by the results for shippers, who are exposed to rather large amounts of mercury vapor emanating from the treated fur piled in the stockrooms.

It may be well to point out the second phenomenon observed. Following the preliminary survey made in the 36 plants, the first thought was that the small "back shop" type of plant with its extremely insanitary conditions would be the one in which considerable mercury exposure would be found; but actual quantitative studies indicated that these small plants had relatively small amounts of mercury vapor and dust in the air, as compared with the larger plants. This may be explained by the fact that the small plants do not allow stock to accumulate, but work intermittently as orders are received. For this reason, very little mercury is handled from day to day, and practically no treated furs are allowed to accumulate in the factories. On the other hand, in the larger plants, considerable quantities of mercury are being used, and hundreds of thousands of treated skins and vast quantities of treated fur are continually present. In addition, large amounts of treated and cut fur stock are allowed to stand about in the various workrooms, often where there should be no mercury exposure, such as those in which preliminary processes are conducted, as in the room of openers and drummers. The remedy is apparent, since by segregation it would be possible to eliminate exposure to mercury for those workers whose tasks do not entail the handling of any mercury compounds or treated stock.

The exposure of workers to mercury compounds in the hatters' fur cutting industry was found to vary from a trace to a maximum of 10.4 mg. per 10 cu. m. in the stockrooms. The exact effect of such exposures will be discussed in another report dealing with the medical phases of this study.

TABLE IV

OCCUPATIONAL EXPOSURE OF HATTERS' FUR WORKERS TO MERCURY VAPOR AND DUST IN FIVE PLANTS

Occupation	*Number of Samples*	*Number of Workers*	*Average Mercury Exposure in mg. per 10 cu.m.*
Shippers	6	11	7.2
Pilers	4	9	5.4
Blowers	13	24	4.6
Cutters	13	47	1.8–4.0*
Sorters	26	197	1.7–3.8*
Blown Fur Packer	1	3	3.8
Brushers	8	24	1.2–3.1*
Fur Chopper	1	2	2.8
Drummers	4	11	0.6–2.5*
Yellow Carrot Dryers	3	6	2.0
Clippers	9	61	0.7–1.5*
Chopped Fur Blowers	2	2	1.3
Skin Sorters	3	5	1.2
White Carrot Dryers or Spreaders	11	32	0.9–1.2*
Carroters	13	40	0.8
Openers	2	30	0.7
Miscellaneous (office, machinists, etc.)	5	43	0.6
Total	124	547	...

* Lower results are associated with processes where control measures are being practised.

The present study afforded an opportunity to determine the effects of inhalation of organic dusts on workers, for which determinations of the dust concentration were made with the Konimeter device. This instrument was used because the nature of the dust

involved precluded the use of the standard impinger method.

Table V presents the results of 112 determinations of the dust exposure. The highest was for drummers, namely, 16 million particles per cu. ft. of air. Blowers were exposed to 9.4 million particles, while shippers were exposed to the lowest dust concentration, 1.8 million particles per cu. ft. It is apparent that hatters' fur workers are exposed to relatively low dust concentrations, as judged by past studies of dusts associated with respiratory diseases.

TABLE V

OCCUPATIONAL EXPOSURE TO DUST AMONG HATTERS' FUR WORKERS
KONIMETER SAMPLES

Occupation	*Number of Samples*	*Millions of Particles per cu. ft.*
Drummers	4	15.9
Blowers	8	9.4
Sorters	31	7.1
Cutters	18	7.0
Openers	6	6.3
Packers	2	4.5
Brushers	16	4.2
Carroters	13	4.0
Clippers	6	3.1
Spreaders	4	2.3
Shippers	4	1.8
Total	112	...

CONTROL STUDIES

Three methods are employed at the present time in the hatters' fur industry for the control of mercury vapor and fur dust: (1) segregation, (2) local exhaust ventilation, (3) general natural ventilation.

SEGREGATION

Segregation is one of the most effective methods of control available. It has a definite application to those operators who are concerned with the handling of raw, untreated pelts, namely, openers, drummers, skin sorters, and clippers. Complete segregation of those employed in these occupations would free 21.3 per cent of the workers from mercury exposure. Table VI illustrates how exposure to mercury may be decreased by segregating drummers and clippers.

LOCAL EXHAUST VENTILATION

No data are available relative to the air movements required for the control of mercury vapor and fur dust by local exhaust systems. The efficiency of the air volumes used for the removal of mercury where exhaust equipment has been installed has never been studied. In fact, brushers, cutters, and blowers have been exhausted chiefly to eliminate the nuisance caused by the dust generated, and even in these instances, efficiency has generally been based on the visual improvement secured. However, exhaust systems, as may be seen by reference to Table VI, decrease

TABLE VI

EXPOSURE OF HATTERS' FUR WORKERS TO MERCURY VAPOR AND TREATED FUR DUST UNDER CONTROLLED AND UNCONTROLLED CONDITIONS

Occupation	*Total Mercury Exposure in mg. per 10 cu. m.*		*Average Air Flow, C. F. M.*	*Method of Control*
	Uncontrolled	*Controlled*		
Drummers	2.5	0.6	...	Segregation
Clippers	1.5	0.7	...	Segregation
Brushers	3.1	1.2	300	Local exhaust ventilation
Cutters	4.0	1.8	383	Local exhaust ventilation
Sorters *	3.8	1.7	383	Local exhaust ventilation
Blowers	4.6	0.7	2,000	Local exhaust ventilation
Pilers	5.4	Trace	...	Good natural ventilation
Storage workers & shippers	7.2	Trace	...	Good natural ventilation

* Depend on exhausted cutters

considerably the mercury exposure.

The method of control used on brushing machines is illustrated in Figure II. The exhaust opening is located directly behind the revolving brush and the air is compelled to enter upward from the front of the machine which is open. An average of 300 cu. ft. of air per minute per machine was found to produce the improvement indicated in Table VI. The reduction shown was obtained in a plant in which more brushes were operated than in the plants without control. This fact also implies the presence of more carroted skins in the brushing department which are continuously giving off mercury vapor.

Cutting machines produce considerable dust due to vibration and to the fan action of the cutting blades, to which not only cutters, but also sorters who are associated with them are exposed. Thus, as may be seen from Table III, 36.3 per cent of the workers in the industry are exposed to dust created by this operation alone. These occupations are, moreover, exposed to mercury vapor emitted by the large quantities of carroted skins and cut fur which are constantly present. The reduction through exhaust ventilation of mercury present in the air, both as vapor and as a constituent of the dust, is clearly shown in Table VI.

The manner of exhausting cutting machines is illustrated in Figure III. It will be noted that the hood is located immediately behind the cutting blades, and draws air upward from the waste hopper below the machine. The 16 cutting machines equipped with exhaust hoods studied each handled an average of 383 cu. ft. of air per minute. This value was exceeded considerably on some machines located close to the exhaust fans, but the increased air flows apparently did not interfere with the cutting operations.

Tables V and VI indicate blowers to be associated with high mercury vapor and dust exposures, due to the presence of large amounts of treated fur and to the nature of the work done by blowing machines. To control the dust generated by one type of blower, an almost semicircular hood concentric with the screened top of the blower is used. The hood is constructed of varnished

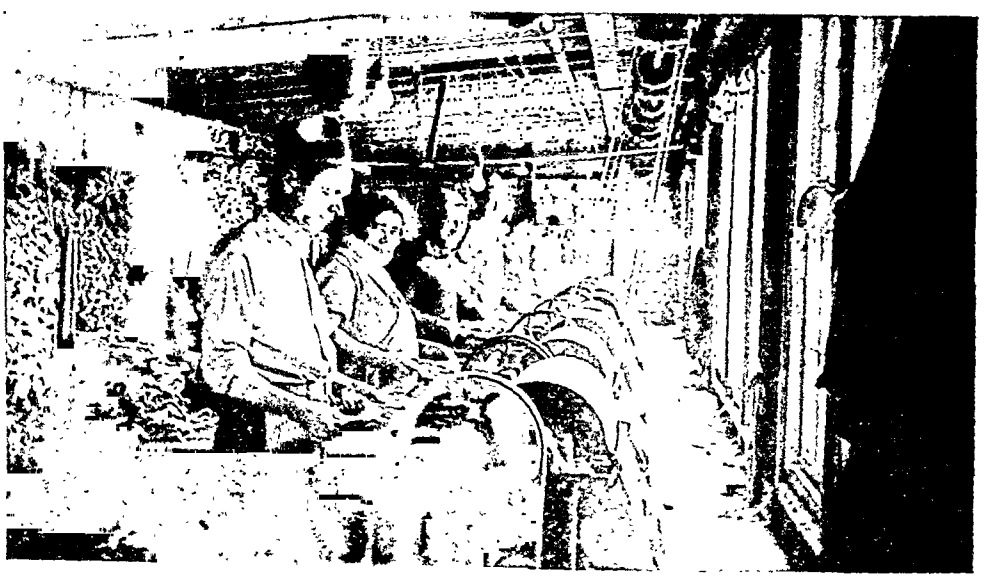


FIGURE II—Brushing carroted furs. Note method of exhausting.

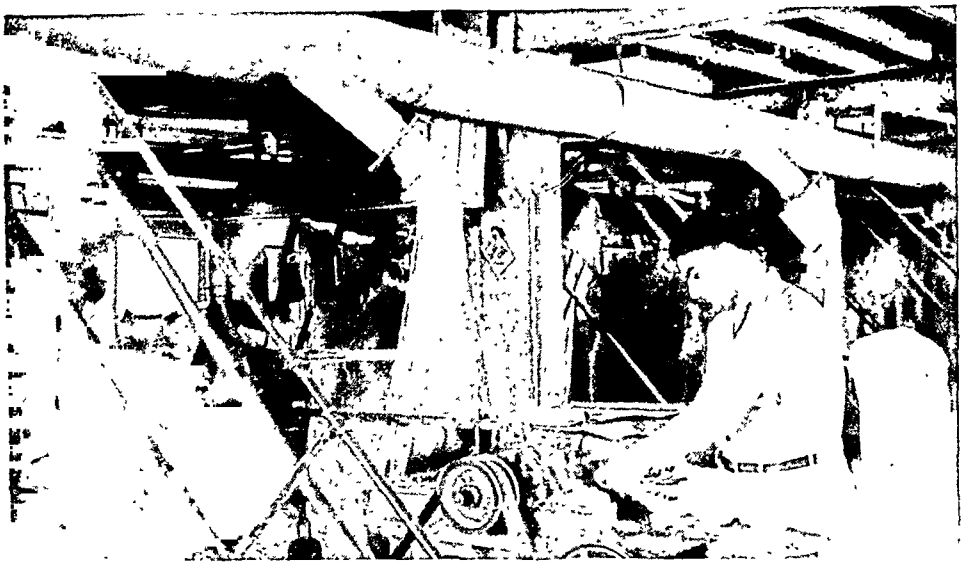


FIGURE III—Cutter feeding brushed carroted fur into cutting machine. Note exhaust.

cloth in order to reduce the weight of the blower top, which must be removed periodically for cleaning. An adapter is fitted to the feeder end of the hood and connected to an exhaust leader. Air is thus compelled to move from the open and across the screened top of the blower and thence to the exhaust system. Ventilation studies made on this type of blower gave average air flows of approximately 2,000 cu. ft. per minute.

GENERAL NATURAL VENTILATION

This method of control was found in piling rooms and fur storage basements. Because the storage of large amounts of treated fur is productive of considerable amounts of mercury vapor, it is essential that adequate air changes be provided. Good natural ventilation was found to be effective in 1 piling room and 1 storage room, in which outdoor air was forced to sweep through the rooms for 12 hours each day. Natural ventilation must not be considered as adequate unless there is a continuous positive sweep of fresh air.

RECOMMENDATIONS

The recommendations which follow are not based on any knowledge at this time of the maximum amount of mercury which may be inhaled with safety, but on what has been found to be good engineering practice in the industry itself.

1. By segregating those operations handling untreated skins, approximately 23 per cent of the workers may be removed entirely from the hazard of mercury exposure.
2. Local exhaust ventilation properly designed and maintained for such operations as cutting, brushing, and blowing, will decrease the exposure for the workers in these occupations.
3. Good natural or mechanical ventilation decreased the amount of mercury associated with the occupations of piling and shipping.
4. Since this study showed that in large plants considerable exposure may be attributed to the handling of mercury compounds in bulk, and to the storing of large quantities of treated fur, it is recommended that all treated material be removed from workrooms as quickly as possible and stored in well ventilated rooms.
5. Good housekeeping and general sanitation should serve to diminish the mercury concentrations in the workrooms. This study shows that mercury vapor is being generated

constantly from treated fur. Hence, if treated fur skins and dust be allowed to accumulate, they will be a source of mercury vapor. It is recommended, therefore, that all floors, benches, and other objects on which dust may accumulate be swept and cleaned daily. Sweeping should be accomplished by either wet methods or by vacuum. In addition, a complete general cleaning should be instituted once a week. In the larger plants it may be well to delegate the maintenance of protective equipment and the practice of good housekeeping to some responsible official who should make periodic inspections of all devices and methods used to minimize the mercury hazard.

6. As a result of this study, it was shown that many of the plants have their processes very poorly arranged. Such practice is not only inefficient from the standpoint of production, but in this particular case serves to increase the exposure to mercury.

SUMMARY

The present report discusses the technic employed in conducting complete engineering surveys of the working environment for the purpose of determining the relationship between industrial environment and health. In the present instance this type of survey is applied to the hatters' fur cutting industry. A discussion is given of the results of a preliminary survey of the entire industry and a detailed study of 5 representative plants. The various instruments and methods used in determining the exposure of workers to mercury are described, such subjects as processes and occupations involved in the production of hatters' fur are discussed in detail, as well as the occupational exposure to mercury vapor and dust, and the methods for minimizing this exposure. Specific recommendations for the control of the mercury hazard in this industry are also presented.

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EDITORIAL SECTION

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THE VENEREAL DISEASE CONFERENCE

DR. Thomas Parran's article in the July *Survey Graphic,* "The Next Great Plague to Go," and its abbreviated offspring in the *Reader's Digest* created a commotion that literally was heard around the United States, if not far beyond. The interest and activity resulting from this timely contribution was capitalized in the recent 3 day conference on venereal disease control work held in Washington, D. C., December 28–30, 1936.

Attended by approximately 1,000 expectant, even militant, observers from all parts of the United States, the conference proved that constructive thinking on this complex subject can be stimulated and to a considerable extent crystallized in a comparatively short period of time. From all parts of the country came state and local health officers, representatives of state medical societies, venereal disease control officers, epidemiologists, syphilologists, laboratory workers, university professors, physicians, nurses, and many others keenly interested in waging an effective battle against those ancient enemies, the venereal diseases.

The conference followed the conventional procedure of key-noting on the first day, particularizing on the second, and summarizing on the final day. President Roosevelt in a letter of greeting, and Assistant Secretary of the Treasury Josephine Roche in a forceful address, indicated a surprisingly complete knowledge and sympathetic understanding of the serious problems confronting the conference. In indicating the trend of the deliberations, Surgeon General Parran urged that it be "a working and not a talking conference."

On the first day such seasoned campaigners as Folks, Godfrey, and Clark of New York, Stokes and Pelouze of Pennsylvania, Hazen of Washington, Brown of Kansas, and DeKruif of Michigan, stressed the main points to be considered. Following closely upon the ringing first day enunciation of principles came the

more detailed and finely specialized discussions directed particularly to the public health aspects of the venereal diseases. In the several sections into which the conference resolved itself the following leading topics were discussed: public health aspects of syphilis, treatment as a factor in controlling syphilis, medical follow-up of the venereal disease patient, the rôle of the private physician in the control of venereal diseases, and the public health control of gonorrhea. While the treatment available in venereal disease clinics is not always of the best, it is often better than that provided by the rank and file of the medical profession.

Throughout the discussions by persons prominently identified with the control movement there was a manifest determination to be practical and yet to omit no legitimate means of contributing to the desired result. It was also worthy of note that, while the conference was willing and able to suggest how best the general public might be made aware of the seriousness of the venereal disease problem, it did not spare its own members or the medical profession from the benefit of educational efforts. The conference achieved something of a record for unanimity of agreement upon general principles. Several minor flurries, such as those relating to prophylaxis and the procedure to be observed in securing case reports, quickly subsided under the soothing influence of compromise.

Although we are theoretically in a position to deal effectively with syphilis, precise knowledge concerning many phases of it is lacking. There is always the chance that clearing up unknown or disputed points may provide more effective means of control than are now available. Therefore, further knowledge is needed concerning the life processes of the *Treponema pallidum*, the clinical course of the disease, and the defensive reaction of the syphilitic individual. Research should also be able to throw additional light on methods of transmission, improved prophylaxis and treatment, and clinical management of the venereal diseases.

The reports adopted by the entire conference were substantially as follows:

Prevalence, trend and economic aspects of the venereal diseases—The conference freely acknowledged that statistical data purporting to indicate the incidence of venereal disease are manifestly tentative and inadequate. At the same time it was regarded as probable that there is an annual minimum incidence of 681,000 new cases of syphilis. In the population as a whole, the incidence of all forms of syphilis is believed to range between 5 and 10 per cent. In admitting the probable inaccuracy of these estimates, the conference felt the need not only for gathering more accurate statistics, but also for the acquisition of statistical methods which will aid in ascertaining the trends, incidence, and economic aspects of the venereal diseases.

Public health control of syphilis—While the conference stressed the importance of treating all cases of syphilis promptly and thoroughly, the province of the private physician was respected, thereby maintaining the confidential relationship between patient and physician. At the same time emphasis was placed upon the necessity for adequate treatment of indigent syphilitics, ability to pay being determined by trained social workers. The reporting of patients by name and address, as in other communicable diseases, is to be encouraged rather than demanded at the present time. Probably the most important recommendations were those for free laboratory and consultation services and free drugs for all patients, regardless of ability to pay. Despite minor opposition, it was recommended that prophylaxis be included in the anti-syphilis program.

Because of the varying conditions there is not standardized venereal disease control procedure which can be recommended and enforced in all sections of the country. While general principles may be the same, programs must obviously be varied to meet local needs and peculiarities.

Treatment as a factor in the control of syphilis—Presenting a comprehensive report in which early and thorough treatment was emphasized, the section having this subject in hand further stressed the importance of discovering and adequately treating pregnant syphilitic women. In so far as public health departments are concerned, it was felt that the distribution of drugs should be confined to established remedies.

It was acknowledged that many physicians are not trained to treat syphilis according to approved methods. Therefore, renewed educational efforts, beginning in medical school and continuing throughout the individual's professional life, were advocated as a means of increasing diagnostic, clinical, and therapeutic skill.

Medical follow-up of the venereal disease patient—This section, composed almost entirely of nurses and social workers in executive and supervisory positions, presented an interesting and constructive report. It was pointed out that follow-up of certain types of venereally diseased patients can be performed either by medical social workers or public health nurses, provided they are properly trained. When patients are courteously and efficiently handled during their first visits to clinics, much follow-up effort becomes unnecessary. Then, too, a person already known to the patient is able to perform more effective follow-up work. It was felt that, with competent supervision, the extension of the activities of the existing health department staff will best meet the requirements.

Coöperation of the private physician in the control of venereal diseases—While duplicating to some extent the deliberations of the section on treatment, this section made it plain that the private physician has a vital rôle to play in the program. Reëmphasized by this group was the public provision of hospital care, consultation, laboratory service, and drugs. It was also recommended that when necessary, hospitalization, especially for pregnant syphilitic women, be provided at public expense.

The cordial relationship and understanding between physicians and the public health profession was further enhanced by the recognition that venereal disease control is a mutual responsibility in which the medical profession can render invaluable aid.

Public health control of gonorrhea—Those who believe that gonorrhea is a disease to be disregarded because of difficulties attending its control would have been shocked out of their indifference by the report of the section having this subject in hand. This group urged that gonorrhea be placed upon a par with syphilis in research, diagnostic methods, and facilities for adequate treatment. It was also felt that funds commensurate with its importance as a cause of distress and suffering should be more freely forthcoming from federal, state, and local sources.

A feature of the conference was the well timed statement of Dr. A. T. McCormack, President-elect of the American Public Health Association. He pointed out that if the federal government assumes as much responsibility for the control of syphilis as it has done for the care of the end results of this and other preventable diseases it is apparent that the cost to the federal government

of an adequate disease control program will be approximately $25,000,000 annually. Therefore, he proposed, with the approval of the conference that the President and the Congress be requested, by amendments to the Social Security Act, to authorize the annual expenditure of $25,000,000 for controlling the maladies which cause so much physical and mental disability and death.

This conference, sponsored by the U. S. Public Health Service, and so widely attended by persons interested in solving the venereal disease problem, may be regarded as another forward step in achieving results. However, no one should be deluded into believing that the most difficult work has been accomplished. Quite on the contrary, only the ground work has been laid while the real task, fraught with obvious difficulty, lies ahead.

JEROME COCHRAN, M.D.

THE address of the Chairman of the Section on Public Health of the Southern Medical Association,[1] recently given in Baltimore, was notable in more ways than one. A real service has been rendered in bringing to the attention of the generation of public health workers now in active life the remarkable career of Dr. Jerome Cochran, whom the Chairman calls, " The South's First Gift to Public Health." There were probably not more than two present at this address who knew Dr. Cochran, who died in 1896.

Born in 1831, Dr. Cochran had a very wide and remarkable training. He began his career in public health in 1870, probably influenced in this course particularly by his experience with two diseases, the ravages of which he had seen—smallpox and yellow fever. His career was so remarkable that Dr. Cannon said of him: " Conceive a medical and public health organization that will meet conditions 60 years hence, and you will have attained what Dr. Cochran achieved threescore years ago." In other words, Dr. Cochran was far ahead of his time and was able to formulate correct practices for 60 years ahead. What greater tribute could be paid to a man's genius!

The address was so unusual and so well done that the section passed a unanimous vote of thanks to Dr. Cannon.

We cannot let this occasion pass without a little preachment on medical history. We have repeatedly pointed out the great service done by the late Sir William Osler in stimulating study of the lives of physicians who have passed away. He himself was a walking encyclopedia of medical history. Perhaps scientific attainment and accomplishment were the chief objects of his admiration, but he said distinctly that he loved some for their personal character and their influence on the community, and some for their literary ability. In glancing over a single article by Dr. Osler, one finds among American physicians, in addition to many Europeans: John Morgan, David Ramsay, Daniel Drake, John D. Godman, Jacob Bigelow, Nathan Smith, James Jackson, William Charles Wells, J. M. Toner, Elisha North, Samuel Bard, and John Y. Bassett. The writer confesses with some shame that it was Dr. Osler who first called his attention to two of the great men from his home city, William Charles Wells, who was the first medical graduate of the United States to make a notable discovery in physics, and was the first to recognize and announce the theory of evolution by natural selection—preceding Darwin; and David Ramsay, who was one of the very first physicians to make

worthy literary contributions. His *Life of Washington* is now worth its weight in gold, and Dr. Osler advised that every library should have three of his books on its shelves. He mentioned also Samuel Bard, who in 1771 wrote a thesis on Angina suffocativa, which we recognize as an accurate description of diphtheria, preceding Bretonneau by 55 years. Some of the names in the list given above are fairly generally known, but it is a safe guess that the average health worker, and even the average doctor, could not tell one much about even those whose names he recognized.

Public health has now taken in so many professions apart from medicine that it is certain the pioneers to whom honor is due are unknown to many. We need to be reminded of the men who accomplished so much without the aid of bacteriology, with nothing which we would in these days call a laboratory, and with no special training. Those men did, however, cultivate the habit of observation and their senses, and produced results which are the admiration of all today.

An attempt made a few years ago to give some history of the lives of the past Presidents of our Association failed to produce results in a number of instances, yet their achievements were such that they were considered worthy to be Presidents of the oldest public health organization in this country.

Will not the times bring forth some man who will do for public health workers what Dr. Osler did for medicine? It is a rich and fascinating field, worthy of the best talent.

REFERENCE

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A TRIUMPH OF PREVENTIVE MEDICINE

WHEN the Italians invaded Ethiopia, there were predictions of a very high death rate from tropical diseases. In the past, disease has been more fatal, as a rule, to soldiers than the bullets of the enemy. The first exception to this rule was the war between Japan and Russia, where, especially on the Japanese side, modern preventive measures were bought into use and a clear demonstration given of our power to check disease, even under the conditions of warfare. It has been believed that a part of the success of the Japanese Army was due to the circumstance that the war was being fought on virgin soil. In the World War, we had another picture, in spite of the advances made in sanitation between the time of the Japanese-Russian War and the World War. Here we had a new type of warfare, men massed in trenches, rather than fighting in the open fields. The pandemic of influenza came. It is true we were markedly successful in preventing the intestinal infections which have been so fatal in armies in the past, but we had at the beginning a frightful amount of tetanus, a large amount of anthrax, trench mouth, and trench foot.

The Italian Government was wise in making Professor Aldo Castellani general adviser on sanitation in eastern Africa. His account [1] recently given is illuminating. There were in East Africa some 600,000 Italians, 500,000 soldiers and 100,000 workers. Each base hospital had a bacteriological laboratory. There were 55 ambulatory brigades of sanitation, 4 central laboratories, 12 brigades for disinfection, 6 brigades for sanitation of the soil, and 139 equipments for purifying water. The army was equipped with 20 hospitals and infirmaries along the coast and 8 hospital ships, but these necessarily could not do much for the soldiers in the interior in the way of prevention.

To take care of the soldiers, there were 2,500 physicians, the majority of whom had taken courses at the Clinic of Tropical Diseases at Rome, 385 Red Cross nurses, 200 religious sisters, and 16,000 sanitarians and assistant workers. Considering the difficulties of transportation and the necessity of building roads, even with this large number of workers and the great amount of sanitary material provided, the success of the Medical Corps seems remarkable. There were 1,241 cases of pernicious malaria, with only 23 fatalities; 453 hospital cases of dysentery, the majority of which were amebic, with only 1 fatality; 17 cases of recurrent fever, with no deaths; 5 cases of dengue; and 1 case of smallpox, which ended in recovery. There were no cases of typhus, scurvy, leprosy, plague, or cholera among the Italians.

The preventive measures are interesting. All soldiers were given the juice of one lemon every other day. All were given daily 3 tablets of quinine (amount not stated). In the Italian colonies of Somaliland and Eritrea, there were 458 cases of typhoid and paratyphoid reported, with 161 fatalities.

Experience in former colonial wars indicated that there would be some 50,000 cases of illness and several thousand deaths. In addition to the general hygienic and sanitary measures, there was wide use of bacterial vaccines which apparently were highly efficacious.

There were 30 cases of sunstroke, with 7 deaths, a remarkable showing for troops operating in the torrid zone to which they were not accustomed. The regular allowance of wine was given, but other alcoholic beverages prohibited. Tropical helmets were worn and transportation was by motor as far as possible. The mortality of the soldiers in Africa was lower than those of the metropolitan army during the same period of time.

One can only speculate on the enormous amount of money saved to the Italian Government by the Medical Corps of the Army. This is what counts with governments more than the humanitarian side. From the standpoint of the commanding generals, efficiency of the troops is the first desideratum. The handling of the Italian troops in this campaign from the medical and sanitary standpoint is an outstanding lesson in preventive medicine. We will doubtless have complete details in the comparatively near future, but even those which have come to hand demonstrate the power of preventive medicine, and have taken away from war, to a great extent, at least one of its horrors.

REFERENCE

1. *J.A.M.A.*, Nov. 28, 1936, p. 1825.

SUPPLEMENT TO THE MARCH JOURNAL

THE 1936–1937 AMERICAN PUBLIC HEALTH ASSOCIATION YEAR BOOK

The Year Book will include reports of scientific committees presented at the Sixty-fifth Annual Meeting of the American Public Health Association in New Orleans. These will not be published elsewhere.

The Year Book is a valuable reference volume which many health workers regard as part of their permanent desk equipment.

PUBLIC HEALTH EDUCATION*

Seven Hundred and Fifty Thousand Copies—That is the number of copies sold of the original editions of the "National Health Series," small health volumes sponsored in 1922 by the National Health Council.

Last month a brand new series, edited and sponsored by the National Health Council, 50 W. 50th St., New York, N. Y., to sell at *35 cents*, $1.00 for 3 copies. The books are better looking than the old series. Ask for a descriptive folder. Special efforts will be directed to getting these books on sale in department stores, chain stores, drug stores, and other cheap book distribution centers. Get yours from the A.P.H.A. Book Service.

As Others See Our Words—*Word Study,* G. and C. Merriam Co., Springfield, Mass., devoted to the furtherance of good English, quotes the following from an unknown source:

During the history lesson the teacher asked the question, "What do you know of Margaret of Anjou?"

"She was very large, sir," answered one boy. This was new to the instructor, and he asked for the boy's authority.

"It's in the book, sir: 'Among Henry's stoutest supporters was Margaret of Anjou.'"

"Kicks Are Kompliments"—The author of a regular department in *Scouting* (2 Park Ave., New York, N. Y.) reports that—

Two folks read last month's Timely Tips page. We know it because both of them wrote in to kick. One said that the article should have been published next spring, and the other that the writer was misleading the public. Our ego is such that we don't mind what they say just so they say something. Thank you, Scouter friends.

Need we point the "moral" as to the Public Health Education department of the *Journal?*

Is the Color Right?—A writer on color points out that—

The most legible combination of colors is black on yellow. Next in line are green on white, red on white, blue on white, white on blue, black on white.

Where illumination is dim, dark type on a light background is most legible.

In the same article we find a paragraph which seems to point out the weaknesses of printed matter and posters in which there is an array of form and line, and a variety of type faces and sizes.

Even more significant to clear legibility is the need for plain mass and bulk. Many designers seem to think that the greater the contrast the greater the attraction. This is untrue. The whole principle of camouflage is one of contrast—lines, areas, and colors that jump into collision with each other and destroy accurate perceptions of size and shape.

In *PM,* a magazine for production managers and art directors, 325 W. 37th St., New York, N. Y. Dec. 1936. *25 cents.*

What They Believe and Why—Many in the public health field will welcome *The Public Opinion Quarterly,* published by the School of Public Affairs, Princeton University, Princeton, N. J. $4.00 a year; $1.00 a copy.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

The January, 1937, issue of 174 pages offers an attractive range of topics, book reviews, and an extensive bibliography of current literature.

For those who professionally need to study public opinion this magazine is practically "must" reading. And those who, if possible, would understand our times, this journal will be invaluable, and interesting as well.

Was This the First?—"Dr. Edward H. Cary . . . read a paper on Syphilis, Its Prevalence and Eye Ravages, . . . the prevalence of syphilis . . . "

The above is quoted from *St. Louis Post-Dispatch,* Nov. 12, 1929.

Is that the first mention in daily newspapers?

One of Them Is Doomed—A Safety poster put out by Employers Mutuals, Wausau, Wis., reads:

One of them is
DOOMED
to Death or Injury
by an automobile

(photograph of 3 little girls)

Statistics show that of every 3 children born in 1936, one is destined to be killed or injured by an automobile before its normal span of life is completed.

Drive Carefully
WE LOVE OUR CHILDREN

Check Your Amateur Movie—Yes, and double-check it. We believe in the amateur movie for presentation and interpretation of health agencies. We believe in the amateur movie for direct health teaching. We believe in amateur movie production as a device for school and college health education groups.

But we do not believe in the amateur movie which cannot stand up in the face of the questions we quote from *Movie Makers:*

Does the subject matter make sense? Is this a picture about one thing or is it footage whose only uniting link is the fact that it was all taken on four one hundred foot lengths, spliced together for convenience in projection?

Was there a plan behind the filming? Were scenes recorded that will enable the picture to begin at a beginning, progress through a coherent middle, and come to a definite end, or were the shots "catch as catch can" items that no amount of editing can whip into an intelligible whole?

Was the camera work respectable? Was the exposure within one or two stops of the optimum, was the center of interest in focus, does a scene stand still so that the audience can look at it—were these minimum requirements of decent filming met—or does the screen present blurred and dense masses or washed out ghosts that jitter and tremble until the suffering audience closes its eyes?

Was the footage reassembled? Is the original plan improved by rearrangement of sequences, were poor scenes eliminated and were titles provided as necessary guide-posts for the audience or is the screening prefaced by the unhappy, "Of course, this is not yet edited"?

Is the screening comfortable? Can the audience sit so that the picture may be seen clearly, or is the screen dim, the projector out of focus, and are the beholders forced to tie themselves into acrobatic knots in order both to sit and to see?

The same issue of *Movie Makers* (Jan., 1937) includes "I do resolve." Here are 14 "resolves" which support our faith in the amateur movie.

Further foundation for that faith is a membership in Amateur Cinema League, 420 Lexington Ave., New York, N. Y. One cannot well produce a bad movie if he makes use of the services provided by the League.

Here is hoping for new educational movies for display at the 1937 meeting of the A.P.H.A.

More Health Language—As a contribution toward precision in the use of terms we are glad to call attention to

definitions or descriptions of meanings of words likely to be used in popular health education materials. The following is from *Bulletin*, National Tuberculosis Association (Oct. 1936):

"Contact"—a person who has lived or is living for any length of time with a person who has tuberculosis, either open or cured. The terms may apply to a child or an adult in the home, in school, in the workshop or elsewhere.

"Suspect"—a person whose diagnosis on the date of record through a tuberculin test or an X-ray is not altogether clear. The general consensus of opinion seems to favor doing away with this term and to use instead such term as "under observation" or "for further observation" or "observation case," indicating that definite diagnosis is pending.

Where Do We Stand?—Under "Competitions Are Going Out" we find this editorial statement in the *Junior Red Cross Journal*, Washington, D. C. (May, 1936):

Not long ago a certain merchant offered a thousand-dollar prize for the winner of a competition to be conducted in the public schools of Boston. To his surprise, he was met with a courteous but firm refusal. Boston's public schools ban competitions and for some years have had a regulation that "no prize shall be awarded for any contest conducted under the direction of the school committees of Boston." Boston Boy Scouts are now on record against competition and so are the settlement house groups and the Y.M.C.A. of that city. Boston is not unique in this respect. Advanced educators all over the country have long been opposed to contests. Opposition to contests is a settled policy of the national direction of the American Junior Red Cross. It seems to be fairly evident that a successful society depends on coöperation. Ignorance, poverty, greed, natural forces, furnish plenty to combat—coöperatively—to keep society and the individual from becoming soft and flabby.

Give Them a Chance to Like Your Story—Merely getting into a newspaper is not enough. The newspaper readers *must read what you have written* before health education is any further along. Trite and obvious, yes. But many of us do not give newspaper readers a real chance to care to read what we have written.

Any material you want to have make the paper instead of the editor's wastebasket—dress it up! Give it its full chance. Capitalize its newspaper assets. By this I do not mean make it cheap in tone, false to facts, or anything else objectionable that violates truth or dignity. Nor do I mean over-write it in length or floweriness of style. What I do mean is to pick out the novel elements, the broad-importance elements, the human interest elements—whatever is colorful, fresh, or stirring. Tell these things first, in the first few paragraphs. Make these bright factors the opening of the story, what we call in newspaper language, "the lead." Let them, in other words, lead the interest of the reader on to the heavier, more serious details. The reader's interest must be caught by the start of the story or he won't go on reading. Once you have caught his interest, then curiosity, momentum, and perhaps an awakened caring about the subject will carry him on through the less bright parts.

Whatever you may think about this style of presenting material (a style directly opposite to that of theses, novels, and plays which work up through an introduction to the climax or high point), it is the only style that gets across in a newspaper, and the only styles a newspaper editor will pay attention to. It is the newspaper style. The most exciting fact goes in the headlines; then the same fact, with a little more detail, in the first paragraph. Each ensuing paragraph tells in decreasing order of importance the most interesting facts on down the line. The last paragraph is quite truly the bitter end.

The significance of this in the present discussion is twofold. The newspaper style will attract and hold the mass of readers whom you hope to reach with your publicity material, but also it will attract and hold the editor who must pass on it before it gets a chance of being read by the public. No editor will wade through paragraphs of drab or technical statements on the chance that something of general interest may lie modestly waiting at the bottom. He has neither the time nor patience. Furthermore, in a majority of cases, he has not the re-write staff to spend time turning the whole story upside down—sunnyside up as you might say—if there were something bright at the end worth printing.

The above is from "Publicity: Your

Right Hand Man," by Janet Owen. *Journal of Health and Physical Education.* Ann Arbor, Mich. Oct., 1936. 35 *cents.*

The Wholeness of Hygiene Teaching—Two reprints from Dr. T. A. Storey, Stanford University, Stanford, Calif.: "Holism of College Hygiene," and "The Integrated School Health Program." The conclusion:

Unless the college hygiene program operates as a whole in its influence on the student, on his environment, and on his experiences with his environment there can be no great hope for an adequate satisfaction of the responsibilities and educational opportunities of a college or university for the health benefit of its students and of the citizens they are to be. Without holism the programs of hygiene within a college will never achieve their possible maximum of effectiveness.

Greater Appreciation of Its Importance—More than 500 present at the annual conference of Illinois health officers and nurses agreed upon eight "basic needs for advancement in public health service" in that state. One was:

A greater appreciation of the importance of public education as an essential factor in the utilization of preventive medicine.

Illinois Health Messenger, Springfield, reports these "pertinent reasons":

The inadequacy of local public health service, the widespread prevalence of carious teeth and other evidence of improper diet, the large numbers of people, especially children, who are unprotected against smallpox and diphtheria, and the lack of satisfactory sanitation with respect to many water and milk supplies, and the disposal of waste are evidence enough that many people do not appreciate sufficiently the potential advantages offered by preventive medicine. If they recognized and appreciated fully the benefits to health which are obtainable at reasonable expense through organized effort, there would be an imperative demand for adequate public health service.

The need is great, therefore, for expanding health educational activities. With no thought of converting everyone into a doctor or sanitarian, it is essential to create in the minds of a majority of the people an appreciation of the potentialities of preventive medicine strong enough to result in a popular demand for and support of reasonably adequate departments of public health.

Mental Hygiene in Magazines—Says Paul Komora in *Mental Hygiene,* 50 W. 50th St., New York, N. Y. (July, 1936):

The growing interest of popular magazines in mental disorders as a topic of public discussion is to be noted with gratification. No longer is the subject confined to professional and technical journals, or mentioned in the hushed tones and with the reticence that characterized the public attitude in the past. . . .

The past few months have seen the problem discussed in a variety of journals in a series of highly interesting, understanding, and informative articles. To mention a few, we have "Man's Last Specter: The Challenge of Mental Disease," by Inis Weed Jones, in *Scribner's Magazine,* December, 1935; "The Nervous Breakdown," by the editors of *Fortune Magazine* in their issue of April, 1935; "Out of the Shadows," by William Seabrook, in *The American Magazine,* February, 1936; a condensation of Clifford Beers's autobiography, *A Mind That Found Itself,* in the *Readers Digest,* July, 1935; "Message of Hope," by Governor Wilbur L. Cross, in *True Story,* March, 1935; and "That Queer Feeling," by Myron Weiss, in *Vogue,* April, 1936. Two articles, "Is Humanity Going Insane?" and "Your Chances of Going Insane," by Wainwright Evans, will appear in the August and September, 1936, issues of *Physical Culture.* The National Committee for Mental Hygiene collaborated in the preparation of most of these articles, and we welcome the opportunities magazine editors and writers are offering us to present our subject to the public.

Will Study Technics—The Tuberculosis Institute, now on in New York City, is announced to cover the following under the head of "Educational Methods":

Newspaper Publicity: what is news? lists, preparing and placing copy, kinds of publicity material, special campaigns, publicity and promotion.

Graphic Methods: adaptation and use of

exhibits, purposes and audiences, construction costs, lantern slides, motion pictures, entertainers.

The Printed Word: circulars, pamphlets, posters, organization bulletins, typography, layout, illustration, paper.

The Spoken Word: lectures, talks, mass meetings, audiences, speakers, conferences and meetings.

Hygeia, January, 1937—Articles in *Hygeia,* 535 N. Dearborn St., Chicago, Ill.:

Heredity and disease . . . You call them deaf (a hundred years of contrast in conditions) . . . Curious stories about health (origin of "quarantine") . . . Appendicitis (radio talk) . . . Skiing and its health aspects . . . War against dental disease (conservation rather than restoration) . . . The sting ray . . . Gym for Johnny and Jane (changing ideas) . . . Watch your diet (for the calorie-conscious) . . . Diabetes, doctors and dogs . . . The doctor abroad — France . . . The modern background of syphilis control . . . Germs we live with: gonococci . . . Marcello Malpighi (Italian) . . . Microbes versus disease (science's hunt for treasure) . . . The talented child . . . Healthgrams . . . New books on health . . . Radio announcements . . . Questions and answers.

In "School and Health":

Developing wholesome attitudes towards sex . . . Does your school need a junior safety council? . . . Character education on the playground . . . New and revised textbooks on health . . . Health teaching through correlation (West Liberty, Ohio).

ADULT HEALTH EDUCATION

Health education was the subject of a joint round table of health officers and public health nurses at the October meeting of Michigan Public Health Conference.

The newly appointed Committee on Health Education, Western Branch, A.P.H.A., includes: Louis Olsen, Palo Alto, Calif., chairman; Dr. Guy S. Milberry, San Francisco; Ida May Stevens, San Francisco; Alan Blanchard, San Francisco; Florence B. Jordon, San Francisco, secretary.

CHILDREN

"Advancing the Health and Welfare of the Nation's Children through Federal and State Coöperation," by K. F. Lenroot; "Public Health Nursing under the Social Security Act," by Deutsch and Hilbert; "The Social Security Act and Crippled Children," by M. M. Eliot. Reprints. Apply to Children's Bureau, Washington, D. C.

"Physique of School Children," by J. F. Rogers, Office of Education. Supt. of Documents, Washington, D. C. *5 cents.*

Short articles on "Your Child and the School," by Dr. A. G. Ireland, will be supplied to newspapers and other periodicals by Health News Service, 22 E. 40th St., New York, N. Y. Mats will be supplied *free.*

MAGAZINE ARTICLES

Christmas Seal articles appeared in *Readers Digest, Elk's Magazine, Parent-Teacher Magazine* and many others.

"Dyspeptics Never Die," by Dr. Logan Clendening. *Saturday Evening Post,* Sept. 26, 1936. "We cannot afford to be patronizing about dyspeptics. Under a surface perhaps slightly ridiculous, strange, gaunt emotions stalk in the gloomy shadows of their subconsciousness."

"How to Take a Bath and Live," by Dr. L. I. Dublin. *This Week* (Sunday magazine section). Nov. 29, 1936. "Last year 100,000 Americans were killed or injured in the bathroom."

"Going, Going, Gone: Baldness Takes Its Toll, Despite Rubbings, Tonics, Machines"; "Safe at Home? Domestic Hazards Responsible for 30 per cent of Accidental Deaths." *Literary Digest,* 354 4th Ave., New York, N. Y. Oct. 17, 1936. *10 cents.*

"Keep Your Balance," by H. Lees. *Collier's,* Nov. 28, 1936. The ductless glands.

"The Last of the Taboos," by Dr.

C. M. Hincks. "Mental diseases are due to natural causes that can be investigated by science." *Kiwanis Magazine,* 520 N. Michigan Ave., Chicago, Ill. Nov., 1936. *15 cents.*

"Mechanism of the Body's Filters." *Literary Digest.* Nov. 28, 1936. *10 cents.* "280 miles of tubules in kidneys."

"A Menace to Family Health," by V. H. Parker, M.D. (venereal diseases). *National Parent-Teacher Magazine,* 1201 16th St., N. W., Washington, D. C., Nov., 1936. *15 cents.*

"New St. George for Modern Dragon." *Literary Digest.* Oct. 31, 1936. *10 cents.* "Doctors honor Parran, and his war on neglected plague."

"Plotting Your Curves," by Janet Lane. *Collier's.* Oct. 3, 1936. "How to acquire a good appetite and what you can do with it."

"The Reckless Other Fellow," by B. Sparkes. *Saturday Evening Post.* Sept. 26, 1936. Auto accidents, of course.

"Reducing Weight: Slowly and Safely." *Literary Digest.* Aug. 1, 1936. *10 cents.* "There isn't any short cut to getting rid of that 'bay window.'"

"Sex Problems of Modern Parents," by Havelock Ellis (more than facts needed); "Why You Fear the Dentist," by B. B. Palmer (why?) *American Mercury,* 570 Lexington Ave., New York, N. Y. Oct., 1936. *25 cents.*

"Take Care of That Cold," by Dr. V. G. Heiser. *Collier's.* Dec. 12, 1936. When science will eliminate colds, etc.

"The Tragedy of Private Medicine," by J. Rorty. *Common Sense,* 315 4th Ave., New York, N. Y. Nov., 1936. *25 cents.* "The waste entailed in the present set-up."

"We Are What We Eat," by Dr. V. G. Heiser. *Collier's.* Oct. 10, 1936. The latest on the effects of diet.

"Whose Medicine?" Several pages of letters from readers of articles by James Rorty. *Nation,* 20 Vesey St., New York, N. Y. Sept. 5, 1936. *15 cents.*

"You Need a Change," by Dr. V. G. Heiser. *Collier's.* Nov. 14, 1936. "We are surrounded by custom and we cling to what is familiar."

NEW

Briefs, Maternity Center Assn., 1 E. 57th St., New York, N. Y. New to us. Large double sheet monthly, printed on one side only to facilitate clipping for re-publication, use in meetings, etc.

The Bulletin, issued for three national nurse organizations by Nursing Information Bureau of A.N.A., 50 W. 50th St., New York, N. Y., will no longer appear regularly, and when issued will carry a message to editors of nursing, medical, and related groups.

Bulletin of the American Medical Association has taken the place of *American Medical Association Bulletin.* The new *Bulletin* will appear as a part of the weekly *Journal* of the American Medical Association, and will be "devoted to the economic, business, organizational, and social aspects of medical practice." At 535 N. Dearborn St., Chicago, Ill.

Health Bulletin, Virginia Dept. of Health, Richmond, edited by J. C. Funk, former editor of *Pennsylvania's Health.*

Heart Herald, California Heart Assn., 45 2d St., San Francisco, Calif.

Monthly Health Bulletin, Dept. of Health, Memphis, Tenn. Mimeographed. We wish that it could be mailed flat, not rolled.

Public Health Reminder, Washington State Dept. of Health, Seattle. Small page; mimeographed folder; sealed with state seal sticker; small, extra fold at top of 2d half gives space for a timely statement. We will expect like use to be made of one of the back page spaces.

ORGANIZATION-TRAINING

"Experience of the Health Department in 811 Counties, 1908–34," by Mountin, Pennell, and Flook, U. S. Public Health Service. Supt. of Documents, Washington, D. C. *10 cents.*

"National Governmental Organizations, Chicago." Describes 15 organizations grouped at 850 E. 58th St., Chicago, Ill. For copy *free* address Public Administration Clearing House. The organizations represent legislators, welfare, engineers, housing, etc., etc.

"A Practical Approach to Public Health Problems." Describing the Brooklyn Health Council which seeks to coördinate the activities of public and private agencies, medical and dental societies. Write to 55 Court St., Brooklyn, N. Y.

"Public Health Training at Ann Arbor under the Social Security Act." *Health Officer,* U. S. Public Health Service, Washington, D. C. Sept., 1936. Describes the first course, and future courses at Ann Arbor.

"Tabulation of Health Department Services." The procedures indicated will make more valuable and accurate health education use of comparative statistics. Supt. of Documents, Washington, D. C. *5 cents.*

PAST BROADCASTS

American Medical Association, Chicago, Ill.:

What to do for blind children . . Arthritis . . Help for the deafened . . Community sanitation . . Noise . . Football injuries . . Be thankful . . "Smog" . . Heredity and disease . . Milk . . The gift of health . . Health assets and liabilities . . Winter health hazards . . Don't die of diabetes.

Baltimore City Health Department:

"Keeping well" in industry . . The clinic nurse brings you a message . . Public health in Santa's pack . . Coal furnaces and carbon monoxide . . What can you do about rabbit fever . . Baltimore as a medical center . . Sanitary milk production begins on the farm . . This is National Hearing Week . . Recreation . . The Instructive Visiting Nurse Association.

Connecticut State Department of Health:

The pneumonia season . . Oysters on the half shell . . Saving money for the state (syphilis) . . Pneumonia can be cured . . The industrial worker and personal hygiene . . Cancer . . Rickets in children . . The meal plan needs adjustment . . Beginning school: a new experience . . Teeth and foods . . Forward moves in Connecticut health . . Your temperature of concern to the physician . . Common sense in cancer . . Marked increase in undulant fever . . Placing the barrier against syphilis . . Water and disease.

New York City Department of Health:

Forward to a healthful New Year . . Waistline or life line . . The dangers of fatigue . . Smallpox strikes again! . . Science vs. health charms . . The story of anesthesia . . Our allies against tuberculosis . . The care of the preschool child (2 parts) . . Coughs and cough cures . . Can syphilis be transmitted from mother to child? . . Don't fear cancer . . The danger of having a job (2 parts) . . Importance of temporary teeth . . Heart disease in children . . Our nurses . . There still is diphtheria.

Jefferson County (Birmingham, Ala.) Board of Health:

Headaches . . The cost of tuberculosis . . What happens when we eat . . The first hundred years . . Waist lines and life lines . . The body's politics.

RADIO

"At the Microphone," by H. K. Harrison. A review of essentials in broadcasting. *Better Times,* 44 East 23d St., New York, N. Y. Dec. 7, 1936. *35 cents.*

Education by Radio, 1 Madison Ave., New York, N. Y., issue for Sept., 1936, reports on the activities of the four important groups which are concerned with public policy in radio matters: National Committee on Education by Radio; Federal Radio Education Committee; American Council on Educa-

tion; and National Advisory Council on Radio in Education. *Free.*

For what it may be worth, if anything; an informal check of radio interest among pupils in Samuel J. Tilden High School, New York City, rated "health" as 13th in answer to the question, "What have you learned from the radio?"

A suggestion as to the use of radio: that first use of unusual information be given out through the newspapers rather than to broadcast it. Exceptions would be where minutes, or even hours, count. A possible example: if impostors are collecting money in the name of a health agency it might be wise first to ask the newspapers to issue a warning, and follow with a broadcast statement.

"Index to WHAM Radio Health Broadcasts of the Medical Society of the County of Monroe Public Health Committee." Index covers talks from May, 1930, to March, 1936. Index *free.* Copies of talks *4 cents* each in postage, *$1.00* for a year. Address: Monroe County Tuberculosis Assn., 277 Alexander St., Rochester, N. Y.

The Journal of A.M.A. announces:

The American Medical Association and the National Broadcasting Company are presenting the second series of dramatized health broadcasts under the title Your Health. The first broadcast in the new series, the thirty-second dramatized coöperative broadcast under the title Your Health, was given October 13. The theme for 1936–1937 differs slightly from the topic in the first series, which was "medical emergencies and how they are met." The new series is built around the central idea that "100,000 American physicians in great cities and tiny villages, who are members of the American Medical Association and of county and state medical societies, stand ready, day and night, to serve American people in sickness and in health."

The program is broadcast on the Blue network instead of on the Red network, as originally announced.

The topics are announced monthly in advance in *Hygeia,* the Health Magazine, and three weeks in advance in each issue of *The Journal.*

The 1936 radio program of the Christmas seal campaign of the New York Tuberculosis and Health Assn. included 39 broadcasts, of which 2 were NBC chain, 2 were CBS chain, and 3 via Mutual BS. Copies of the full list free from the Association at 386 4th Ave., New York, N. Y.

The radio bureau of New York City Y.M.C.A. is conducting a series of broadcasts on social hygiene, "Two Doctors Look at Married Life," by Dr. Marie Warner and Dr. Benjamin Warner.

Connecticut State Dept. of Health announces 5 minute broadcasts over WTIC, Hartford, Thursdays at 2:15 p. m. Copies available on request.

Feb. 4—Consider the eyes . . Feb. 11—Child health the year round . . Feb. 18—Public health proposals in General Assembly . . Feb. 25—Is mental hygiene of value? . . March 4—Laboratory in epidemics . . March 11—Your public health nurse needs your support . . March 18—What the figures show.



Children who want rosy cheeks, bright eyes, good grades and lost of "pep" must get 10 hours of sleep and "oceans" of fresh air and sunshine. Those who tease a dog or who run in front of an automobile cannot blame the health department, their teachers, or their parents for what may happen. Others who go to school when sick make it hard for the health department to prevent the spreading of whooping cough, chicken pox, measles, mumps, scarlet fever and other catching diseases. Children that are old enough to go to school should be able to do many things that are healthful and leave undone many things that are harmful.

From *Keeping Fit* by Dr. John P. Koehler in The Wisconsin News (Milwaukee).

REPORTING

Annual report of the Maplewood, N. J., Board of Health is an excellent example of the well done mimeographed report, with a printed cover.

"Dispensary Patients and Economic Status," by Howard W. Green. Cleveland Health Council, 1900 Euclid Ave., Cleveland, Ohio. *$1.00.* New patients of 10 out-patient departments of Greater Cleveland hospitals during 1935. These 44,202 patients are thoroughly analyzed and laid out in 61 maps and charts. Planographed, spiral binding. It is illustrative of a high standard in usable reporting of a statistical study.

If one wishes to check on how the staff of health agency keeps busy he should look up the health education section of the annual report of the Bronx Tuberculosis and Health Committee, 226 E. Fordham Road, New York, N. Y. The report uses a device which simplifies the problem of long headings on a narrow page. The first word is capitalized, starts at left edge of the page, the remainder of the heading, indented a half inch and running across the page, using two lines if need be.

The 19th annual report of the Royal New Zealand Society for the Health of Women and Children provides much detailed information about this organization with its numerous branches, each served by one up to 12 nurses. Headquarters: Queen's Buildings, Princes St., Dunedin, N. Z.

Probably some of our specialists in health department and health association reports have looked over the literature of public reports and have gleaned what is useful to health agencies. But if anyone is interested in checking the possibilities of finding ideas and information it would be well for him to look up "Preparation of Public Reports and Documents: a Bibliography," by D. C. Culver, and published by Bureau of Administration, University of California, Berkeley. *25 cents.* There are 5 pages of references on the preparation of reports, making them readable, and so on. Under types of reports is a page of references to health reports and documents. We would be glad to hear from anyone who checks the references for their value to health agencies.

The smallest of annual reports we have received comes from Bergen County Tuberculosis Assn., Hackensack, N. J. It is mimeographed in novel form.

"Then and Now." New Jersey Tuberculosis League, 15 E. Kinney St., Newark, N. J., report of "30 years of voluntary service in saving human lives." Well set up; plenty of white space. "Highlights of Thirty Years," an interesting chronological record; no contents or index.

With its report lacking either a table of contents or an index, Kern County, Calif., may not always get credit for its work in immunization against infantile paralysis, which appears on pages 42–49. Kern County Health Dept., Bakersfield, Calif.

READING LISTS

"Education," a list of government publications, including safety and health education. Supt. of Documents, Washington, D. C. *Free.*

"Bibliography on Public Health and Allied Subjects." 14th edition. Classified under: Preventive medicine and public health; administration and socio-health problems; laboratory; foods and nutrition; vital statistics; public health engineering; industrial hygiene; mental health; social hygiene and eugenics; tuberculosis; personal hygiene; child, maternity and school hygiene; health education; nursing; reference, medical history, etc.; miscellaneous. American Public Health Assn., 50 W. 50th St., New York, N. Y. *Free.*

THEY DID IT

Arizona State Board of Health, Phoenix, represents a summary of vital statistics on 20 mimeographed pages, letter size (with 2 pages legal size), with copy running at right angles to the usual across-the-page fashion.

The Boston Floating Hospital put out the following invitation, imitation pen writing style:

Will you come to see us on Hospital Day, Tuesday, May 12, any time between two and five o'clock?

It's not exactly a party because we are all in bed, but we'd be glad to see you and you can have some tea downstairs.

Detroit Dept. of Health staff members sent out a neat holiday card.

Holiday greetings from West Virginia State Dept. of Health appeared in a miniature mimeographed folder, French fold, the message lettered across an outline of the state.

The results of a National Negro Essay Contest conducted in high schools are reported in the Nov. and Dec. issues of *Bulletin,* National Tuberculosis Assn., 50 W. 50th St., New York, N. Y.

"The South Shore Nursing Bureau" is a folder which states concisely the facts about a non-commercial nurses' registry. A modernistic touch is given the statement of contents on the cover (repeated as headings on the inside). We wish the printer had omitted the big dots on the cover. The address is: 115 W. Bergen Place, Freeport, N. Y.

"Typical Editorial Comment" is a reproduction of newspaper clippings. National Society for Prevention of Blindness, 50 W. 50th St., New York, N. Y. *Free.* Useful against blindness; illustrative of making clippings work for you.

We have a collection of examples of uses made of newspaper clippings. Just added is a three letter sheet folder reproducing "Typical Editorial Comment on the Henry Street Visiting Nurse Service" as it appeared in New York dailies. David Resnick, 99 Park Ave., N. Y., will send you a copy.



Walking has always been considered one of the most ideal exercises and always will be. Many individuals do some walking almost every day, but very few walk enough. Every well person, whose occupation does not require a great deal of physical exercise, should walk at least two miles a day. Such a walk should be of sufficient rapidity to require deep breathing.

From Keeping Fit by Dr. John P. Koehler in The Wisconsin News (Milwaukee).

WHAT BUSINESS OFFERS

Better not overlook the medical advertisements in health and medical journals. Some of them illustrate splendid writing for popular audiences.

"Kitchen Temperatures" is a publication of Temperature Research Foundation of Kelvinator Corporation, 420 Lexington Ave., New York, N. Y. What refrigeration does for food. *Free.*

A new series of bulletins is offered by Educational Department, California Fruit Growers Exchange, Sunkist Bldg., Los Angeles, Calif.

"What Do You Know about Health?" The cartoon questions and answers offered free by Health News Service, 22 E. 40th St., New York, N. Y., seem as good or better than many of the cartoon treatments of fact and fancy now much used by newspapers.

BOOKS AND REPORTS

Physiological Chemistry — *By J. F. McClendon, Ph.D., and the late C. J. V. Pettibone. (6th ed.) St. Louis: Mosby,* 1936. 454 pp. Price, $3.50.

The Sixth Edition of *Physiological Chemistry* represents a rewriting of a large portion of the text, and constitutes a distinct event in the history of this useful little textbook. Although it is expanded to 454 pages (from 370 in the 5th edition), it retains the traits of a small textbook, Part I, the theoretical section, being even now only 306 pages in extent. The increased paging represents in part the ever growing subject-matter of the science, and in part the result of a rebalancing of the subject matter, bringing subjects that had previously been slighted up to a level that harmonizes with the general standard of this text.

It is gratifying to find the results of modern research move so promptly into an elementary textbook, as we see exemplified in the correlation of sterols with many active principles (p. 76) and the discussion of the protein molecule. Several of the recently elucidated vitamins also illustrate the up-to-dateness of this revision, although information has come in so rapidly that through no fault of the author or publisher the report on the constitution of vitamin B already falling behind the times.

The chapter on vitamins is in reality a new chapter, also those on blood, enzymes, energy exchange, and internal secretions. The paragraphs on teeth are fuller than in some biochemistries, fitting this book for use in dental schools without detriment to its use elsewhere. It is natural and fitting that such an authority as McClendon should handle mineral metabolism and its geographical relationships more fully than is usual. A well selected 16 page glossary of biochemical words is a new feature.

Misprints do not appear to be much in evidence. All in all, the revision has produced a well balanced, up-to-date and stimulating text.

ADDISON GULICK

Snow on Cholera *(Being a reprint of two papers by John Snow, M.D., together with a biographical memoir by B. W. Richardson, M.D. and an introduction by Wade Hampton Frost, M.D.) New York: The Commonwealth Fund,* 1936. 192 pp. Price, $2.50.

This volume is a re-publication of two significant papers by Dr. Snow. The first paper, on the Mode of Communication of Cholera, was published in 1849 and then expanded 5 years later. The second is an essay entitled "On Continuous Molecular Changes," first published in 1853.

This is the second volume sponsored by Delta Omega, the honorary professional society in public health, the first being *Budd's Typhoid Fever* which appeared in 1931. Published by the Commonwealth Fund, the essays are greatly enriched by the biographical sketch written by Sir Benjamin Ward Richardson (1828–1896) and the interpretive introduction by Dr. Wade Hampton Frost.

John Snow (1813–1858) and his writings are fortunately familiar to a growing circle of present-day students

of the public health who admire the clairvoyant discernment of this early student of epidemic disease. As Dr. Frost, who has introduced his students for two decades to these remarkable sources, says in his introduction, it is not easy when divergent theories are presented to distinguish immediately between those facts which are sound and those which are merely plausible.

How Snow perceived the thread of consistency which connected a seemingly chaotic mass of facts and followed it through to the conclusion that bacteriology has since confirmed, he himself tells plainly and simply, with the fresh enthusiasm of discovery, the restraint of a scientist. His account should be read once as a story of exploration, many times as a lesson in epidemiology.

Snow's two treatises, as here reproduced in a form now easily available to all who will read, illustrate the singular clarity of his mind as it followed the facts as he found them relating to the outbreaks of cholera in London. His orderly collection and testing of evidence sets a standard against which any modern epidemiologist may well check his studies. The second paper shows the relationship between his theories of the spread of cholera and epidemic diseases in general. They have been well chosen from his works to illustrate the sequence which marked his habit of mind and placed him, as his friend Richardson said, in the first rank of the Victorian Faculty of Physic. The general conclusions which Snow reached, showing that cholera in London was mostly water-borne, are of course well known. Not so well known or appreciated, however, is the discernment which he showed in examining the facts. A reviewer should hesitate to diminish any of the thrill which a serious reader will surely have on perusing these essays for the first time.

This book is notable for its typography and binding. It has been set to resemble the original type used for the first article, and the minor peculiarities of the format have been carried over so that one has the genuine atmosphere of the original as he turns the pages. In recognition of its excellence and appropriateness, the American Institute of Graphic Arts selected it as one of the 50 best examples of American book-making in 1936. The Fund and Delta Omega are to be congratulated on publishing a book which will be at once a reminder of a primitive day in medical science and a rewarding companion for every student of epidemic disease.

REGINALD M. ATWATER

The Psychology of Dealing with People—*By Wendell White, Ph.D. New York: Macmillan,* 1936. 256 pp. Price, $2.50.

What we used to call tact and diplomacy is here reduced to a science of personal relations. Whether or not an adult can learn and apply these qualities scientifically is another question. In any event, this book like others of a similar nature makes interesting reading. Recognizing that to deal with others successfully it is first necessary to deal with oneself, many pages are devoted to improving one's own personality. There are chapters on furthering mental health and preventing peculiar behavior. So much of the day-to-day work of public health people involves dealing with other people that a treatise of this kind should be helpful in carrying out any public health program.

HOMER N. CALVER

Keeping Your Child Normal—*By Bernard Sachs, M.D. New York: Hocber,* 1936. 148 pp. Price, $1.50.

This book is essentially a revision of Dr. Sachs' earlier one, *The Normal Child,* with new sections on Heredity and Environment, and Truancy and De-

linquency. In every approach to the child at each age level stress is laid upon normal development. The author asserts that we should have due respect for the past and should not scorn tradition. Experience is the best teacher after all. While granting inborn influences, Dr. Sachs feels that environment is more important in shaping the individual than is heredity.

The *laissez faire* methods of child culture in vogue today are deplored. "Rational discipline is needed for the general good." The last chapter on "The Use and Abuse of Psychoanalysis" is a scathing criticism of the Freudian School of Psychoanalysts "who care less about the scientific value of their professed beliefs than the impression they can make upon a gullible public." Dr. Sachs is avowedly out to scalp Freud and his devoted adherents and he uses every instrument of forceful English to complete the process. According to the author, "there is a total lack of scientific evidence in all parts of this psychological doctrine. It is speculation of the rankest sort . . ." "The man who practises this method exclusively is a faddist if not worse . . ." and much more in the same strain.

RICHARD A. BOLT

Facts and Frauds in Woman's Hygiene—*By Rachel Lynn Palmer and Sarah K. Greenberg, M.D. New York: Vanguard,* 1936. 311 pp. Price $2.00.

The title explains exactly the material included in this book. It will be welcomed by crowds of women who have been confused by misleading claims and will expose some of the dangerous products that are on the market today. The book is readable and enlightening. It is good to note that it starts with facts in woman's hygiene before it undertakes to expose the frauds and over-statements. It is of real value in that it gives the medical opinion on certain normal functions of women about which there have been many misleading theories. It frees the words "Feminine Hygiene" of the sinister meaning which they have come to have for many of us. It will therefore be a valuable contribution to a saner viewpoint for many women while it explodes many theories and erroneous statements. It should be read by every married woman. GLADYS GAYLORD

Nursing as a Profession. — *By Esther Lucile Brown. New York: Russell Sage Foundation,* 1936. 120 pp. Price, $.75.

This book is one of a series of monographs dealing with certain established or emerging modern professions. It offers a good picture of the present situation in nursing. The material has been drawn from up-to-date, authentic sources, and may, therefore, be read with confidence that the information given is reliable.

The aim of the series as stated by the author is to assemble and interpret data about the professions in a way which will be useful to those who are striving to contribute to "the welfare both of their members and of society." This aim seems to have been accomplished, as well as may be done in a brief discussion, in this volume on nursing. In order to accomplish the objective stated, material is presented on the education of nurses in the United States, on national organizations, on questions of supply of and demand for nurses, on distribution of nurses, and on salaries in the field. Some attention is given also to phases of public health nursing.

One of the best parts of the book is the summary, which consists of a statement of the present status of nursing, of recommendations made as

the result of two current studies of nursing, and of a brief statement of the means needed if nursing is to control its present standards in the interests of better nursing for the community.

The book should be particularly useful to board and committee members of health organizations and other persons who are interested, without going too far afield in their reading, in gaining insight into the aims, present activities, and problems of the nursing profession. The size and the entire make-up of the book make it convenient to use in this way, and the reviewer recommends it especially for this purpose. ANNE L. AUSTIN

A Library Handbook for Schools of Nursing—*Prepared by the Sub-Committee on the Nursing School Library of the Curriculum Committee of the National League of Nursing Education in collaboration with The Bellevue School of Nursing. New York: National League of Nursing Education,* 1936. 264 pp. Price, $2.50.

Among the many studies which are taking place in nursing education today, perhaps the most far-reaching is the study on the Curriculum of Schools of Nursing undertaken 2 years ago by a committee of the League of Nursing Education. This committee, early in its work, realized that, if the new curriculum was to be administered effectively, instructors and students must have access to good libraries. Previous studies had shown an alarming lack of books in the libraries of many schools with few or no funds provided each year for magazines and reference material. Accordingly, a Sub-Committee on the Nursing School Library was appointed, to whose leadership we now owe the publication of a most helpful library handbook for the use of those concerned with the administration of such libraries. It includes a short reading list on the administration of special libraries and also a list of recommended periodicals and free or inexpensive material. The bulk of the handbook is taken up with a suggested list of subject headings for a catalogue and for subject file, and with a description of a classification scheme used at the library of the Bellevue School of Nursing. One sub-heading in this classification is concerned with public health, another with food, nutrition and dietetics, and a third with nursing in its various phases. Though the use of such a handbook might be very limited in the field of public health, there is so little literature on this subject that those who are concerned with the development and administration of health libraries may find it of interest.

KATHARINE FAVILLE

Health Guides and Guards—*By Francis P. Wall and Louis D. Zeidberg, M.D. New York: Prentice-Hall,* 1936. 208 pp. Price, $1.35.

An elementary text of the usual organization, a chapter or more being devoted to discussion of the structure, function, and hygiene of the various body "systems."

The major emphasis, nearly one-third of the book, is on the genital system and on the sexual diseases.

In view of the present intense interest and emphasis regarding mental hygiene, the nervous system is extremely slightingly treated.

Facts are clearly and interestingly stated. CHARLES H. KEENE

A Diabetic Manual—For Practitioners and Patients—*By Edward L. Bortz, M.D. Foreword by George Morris Piersol, M.D. Philadelphia: Davis,* 1936. 222 pp. Price, $2.00.

This book is the combined effort of six authors. The concept of having a

dietitian, a surgeon, a dentist, a chiropodist, and two physicians write chapters on their various specialties is excellent. However, this has resulted in certain difficulties such as the repetition and overlapping of subjects as well as the use of different standards by the various authors. The chapters on "Symptoms and Diagnosis," "Pregnancy," and "Diabetes in Children," are bright spots in the book. The chapter on "Food Analysis," as well as the "Diabetic Recipes," are much the same as those previously published. It would be preferred to have the tables on "Caloric Value of Foods" presented in terms of average servings rather than in terms of standard 100 gram units. For the use of the physician, a table on the differential diagnosis of coma has been worked out. The authors utilize the new carbohydrate percentage figures. There is a section on "Insulin and Protamine," as another novel feature of the *Manual*. The chapter on "Dental Care" is too brief. The terminology is in some chapters too technical for the patient, and in other chapters the data are insufficient for the physician.

HERBERT POLLACK

Health and Achievement—*By Edgar A. Cockefair and Ada Milam Cockefair. Boston: Ginn,* 1936. Price, $1.60.

This textbook of physiology and hygiene is frankly for high school use. It differs from the ordinary textbook on this subject in its wide choice of living material and in the interesting manner of presentation. The authors' aims, as briefly stated in the preface, are:

"To present the facts of physiology and health in such a way as to emphasize their cause-and-effect relationship, instead of trying to drive them home dogmatically.

"To relate health to a wide range of interests.

"To introduce health study into personal practice, making practice a recognized, accredited part of the course.

"To develop a self-control habit in the student for the sake of ultimate happiness rather than temporary pleasure.

"To instill in the mind of the student the idea that he is largely the builder of his own physique and that in the exercise of this privilege he is more or less responsible for the physical welfare of others."

The book is adapted especially to classroom instruction by unit organization with observation study. There is a study guide at the end of each chapter. The self-tests and suggested readings add to the practical value of the book. It is profusely illustrated with up-to-date material which will appeal to the imagination of youth.

RICHARD A. BOLT

Manual of Modern Cookery—*By Jessie Lindsay and V. H. Mottram. (3d rev. ed.) Toronto: Clarke, Irwin & Company, Limited,* 1936. 316 pp. Price, $1.35.

While this book gives an unusual number of good recipes for the preparation of foods for every day as well as for state occasions, its great value, we believe, lies in the introductory chapters, which describe the principles of diet in relation to cookery, which includes much physiology, and the principles of cookery, the latter giving the reason for many of the things which are done by a good cook.

The arrangement is excellent and is aided by a good index. One can glance at the first page of each section and see exactly what is included. The American will find some words new to him, like "tammy," and other terms over which he has to do some thinking and perhaps consult an English dictionary.

The book is well bound and printed, and can be thoroughly commended.

MAZŸCK P. RAVENEL

Food, Fitness and Figure—*By Jacob Buckstein, M.D. New York: Emerson Books, Inc.*, 1936. 252 pp. Price, $2.00.

This is an excellent little book on diet for the general reader. The facts presented are reliable and free from the faddism that permeates so much of the popular literature on this subject. The style is readable and the type is good. As pointed out by the late Dr. Harlow Brooks in a brief introduction, the author, who is a gastroenterologist, is competent to undertake this volume and has written a text which should be valuable to the patient or to the casual reader interested in diet.

JAMES A. TOBEY

BOOKS RECEIVED

INTO THIS UNIVERSE. THE STORY OF HUMAN BIRTH. By Alan Fran Guttmacher. New York: Viking Press, 1937. 366 pp. Price, $2.75.

OFFICIAL AND TENTATIVE METHODS OF ANALYSIS OF THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS. 4th ed. Washington: Association of Official Agricultural Chemists, 1936. 710 pp. Price, $5.00.

WILLS HOSPITAL EYE MANUAL FOR NURSES. By Gladys Elaine Cole. Philadelphia: Saunders, 1936. 202 pp. Price, $1.75.

DIETETICS SIMPLIFIED. THE USE OF FOODS IN HEALTH AND DISEASE. By L. Jean Bogert, and Mame T. Porter. New York: Macmillan, 1937. 637 pp. Price, $3.00.

SCHOOL HEALTH PROBLEMS. By Laurence B. Chenoweth and Theodore K. Selkirk. New York: Crofts, 1937. 387 pp. Price, $3.00.

DR. DAFOE'S GUIDEBOOK FOR MOTHERS. By Allan Roy Dafoe. New York: Messner, 1936. 246 pp. Price, $1.50.

LABORATORY OUTLINE IN FILTERABLE VIRUSES. By Roscoe R. Hyde. New York: Macmillan, 1937. 85 pp. Price, $1.50.

VITAMINS AND OTHER DIETARY ESSENTIALS. By W. R. Aykroyd. 2d ed. London: Heinemann, 1936. 226 pp. Price, $2.75.

ON YOUR GUARD. THE PREVENTION AND TREATMENT OF SEX DISEASES. By Carl Warren. New York: Emerson, 1937. 160 pp. Price, $1.00.

ROADS TO HEALTH AND HAPPINESS. By Oscar C. Mueller. New York: Prentice-Hall, 1936. 137 pp. Price, $2.00.

DISTRICT HEALTH ADMINISTRATION. A STUDY OF ORGANIZATION AND PLANNING. By Ira V. Hiscock. Lancaster: Science Press Printing Co., 1936. 115 p. Price, $.65.

PARENT-TEACHER PUBLICITY. Edited by Clarice Wade. Washington: National Congress of Parents and Teachers, 1936. 83 pp. Price, Paper, $.25; Cloth, $.50.

TUBERCULOSIS EDUCATION. A GUIDE FOR PROFESSIONAL AND LAY WORKERS. By Elma Rood. Madison College, Tenn.: Rural School Press, 1936. 125 pp.

RURAL HEALTH PRACTICE. By Harry S. Mustard. New York: Commonwealth Fund, 1936. 603 pp. Price, $4.00.

MEDICOLEGAL CASES. Abstracts of Court Decisions of Medicolegal Interest, 1931–1935. Compiled by The Bureau of Legal Medicine and Legislation, American Medical Association. Chicago: American Medical Association, 1936. 888 pp. Price, $5.50.

DISPENSARY PATIENTS AND ECONOMIC STATUS: CLEVELAND, 1935. By Howard Whipple Green. Cleveland, Ohio: Cleveland Health Council, 1936. 64 pp. (61 maps and charts). Price, $1.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Bibliography on Foster Family Care—The Russell Sage Foundation gives a selected bibliography that should be of use in giving health workers the best current literature on care of foster children. Books, magaines, conferences, and statistical reports are included.

ANON. Foster Family Care. Bulletin of the Russell Sage Foundation Library, No. 139 (Oct.), 1936.

Better Obstetrical Care—In 1935, one-third of the babies born in this country were born in hospitals. This series of papers discusses how care for patients may be improved, both when given by specialists and by the general practitioners. What the departments of anesthesia, nursing, and admissions can contribute to improved care is discussed.

ANON. Hospital Standardization Conference of the American College of Surgeons. (A Symposium.) The Adequate Care of the Obstetrical Patient in a General Hospital. Hospitals. 10, 11:22 (Nov.), 1936.

Education of Teachers of Social Science—In the preparation of Teachers in social science at New College of Columbia University, selected students have a rich experience in living while they study—first in a southern rural community, then in New York City, followed by a year in a European country. New College is new in its curriculum as well as in development, experimenting with the factors which go into the development of fine individuals, able citizens, and skilled teachers. Everyone concerned with schools will be interested in this description of one of our most progressive colleges.

ALEXANDER, T. New College Program for the Education of Teachers in Social Sciences. Educational Administration and Supervision. XXII, 6:447 (Sept.), 1936.

Work for the Health Educator—Misinformation, unsocial attitudes, and ignorance that need dispelling by effective health education are presented for consideration by the educator.

BAUER, W. W. Opportunities and Obligations in Health Education. J. Health & Phys. Ed. 7, 10:610 (Dec.), 1936.

Typhoid Carriers Abide by the Rules—Typhoid carriers, though 675 have been discovered during the past 30 years in New York City, are not considered so difficult a public health problem as they once were.

BOLDUAN, C. F., and FRANT, S. The Typhoid Carrier Situation in New York City. Quart. Bull. (New York Dept. of Health) 4, 4:97 (Nov.), 1936.

The Aged—Their Problems and Needs—Those who give care to the chronic sick or aged will find much of interest in this article which gives a series of case studies of aged clients in a case working agency, discussing their worries, fears, and needs.

BROWNING, G. Social Service and the Aged. The Family. 17, 8:271 (Dec.), 1936.

Diphtheria Immunization Status—Among about 9,000 representative families throughout the United States, it was found that 43 per cent of all children under 9 years had been immunized, the percentage dropping in older groups. Among preschool ages, the percentage of protection increases with the family income. The peak of diphtheria mortality occurs at 2 years, maximum case fatality under 1 year.

COLLINS, S. D. History and Frequency of Diphtheria Immunizations and Cases in 9,000 Families. Pub. Health Rep. 51, 51:736 (Dec. 18), 1936.

Carbon Monoxide — Physiological effects of carbon monoxide poisoning are discussed, together with methods of resuscitation with carbon dioxide, oxygen, and artificial respiration.

DRINKER, C. K. Carbon Monoxide Poisoning. J. Indust. Hyg. 18, 9:637 (Nov.), 1936.

Permanence of Diphtheria Immunity—Blood serum tests to determine antitoxic level 2 years after immunization with diphtheria toxoid indicated a 90 per cent continuing immunity.

FARAGO, F. Antitoxin Content of Serum Two Years After Anti-diphtheria Inoculations. Am. J. Hyg. 24, 3:447 (Nov.), 1936.

Preventing Diphtheria in Baltimore—Why is there less diphtheria in Baltimore? There are fewer Schick positives, due no doubt to immunization, but other factors, such as diminished infection-frequency and smaller ratio of cases to infections must be due to some other cause, probably some "natural" increase in human resistance, or some change in bacterial quality of the disease.

FROST, W. H. Diphtheria in Baltimore: A Comparative Study of Morbidity, Carrier Prevalence and Antitoxic Immunity in 1921–24 and 1933–36. Am. J. Hyg. 24, 3:568 (Nov.), 1936.

Accidental Deaths Among Infants —The principal cause of accidental death of infants is suffocation, and accidental deaths stand in 13th place among causes of death (under 1 year). There has been no improvement in the record during recent years, with the exception of infants in the Southeast. Reasons are not discussed.

GAFAFER, W. M. Some Changes in the Mortality from Accidental Mechanical Suffocation among Infants under 1 Year Old in Different Geographic Regions of the United States, 1925–32. Pub. Health Rep. 51, 48:1641 (Nov. 27), 1936.

Social Work Salaries—The Department of Statistics of the Russell Sage Foundation publishes a study of the salaries of private family case work organizations as of March, 1936. Tables list salaries according to positions — executives, supervisors, case workers, student-case workers, home economists, etc.—and to size of staff and size of city. It is interesting to compare these with studies made by the N.O.P.H.N. each year for various types of public health nursing positions, the last of which was published in the May, 1936, issue of Public Health Nursing.

HURLIN, R. G. Salaries in Private Family Case Work Organizations in March, 1936. The Family. 17, 8:251 (Dec.), 1936.

About Tuberculosis in Negroes—Low tuberculosis rates were found among Bush Negroes in Dutch Guiana, who have been in the past sufficiently in contact with white people to have been infected. The satisfactory hygienic conditions under which they live is assumed to have affected the tuberculosis rate. This would indicate that economic and sanitary conditions may have much to do with the extent of infection among Negroes in the United States.

KAHN, M. C. A Tuberculin Survey of the Upper Ancaner Bush Negroes in Dutch Guiana. Am. J. Hyg. 24, 3:456 (Nov.), 1936.

How Much Health Department Service Do Infants Need?—Services rendered to a group of infants in the Bellevue Yorkville District (New York City) were reviewed and it was found that some mothers sought and received an unusual amount of care. In order to distribute services to all infants in need, an occasional analysis such as this

is helpful. Especially valuable is the analysis of the interval of time between infant visits in home or clinic, revealing how profitable periodical study of records may be.

LEWIS, R. L. The Frequency of City Health Department Services for Infants. Milbank Memorial Fund Quart. 14, 4:362 (Oct.), 1936

More Opinions on Dental Decay—Two British scientists discuss the relative merits of the nutritional versus the bacterial theories of caries. The first would change the "clean teeth never decay" slogan to "clean teeth seldom decay." The second writer adds that although the nutritional theory of dental health has been given up by the great majority of dental experts, no doubt there are many medical men who still cling to it. To floor these latter gentlemen, the author asks why certain teeth decay much more frequently than others, why does decay occur most frequently in certain areas of the tooth, and why do devitalized teeth resist decay equally with live ones in the same mouth? Then the questions get harder.

MACPHEE, G., and WALLACE, J. S. Causation of Dental Decay. Pub. Health. 50, 3:82 (Dec.), 1936.

Testing Dangerous Dusts—Methods are proposed for determining the harmfulness of dusts. Injected peritoneally into guinea pigs, dusts are absorbed, remain inert, or cause proliferation. The effect in the animals corresponds to the chemical effect of the dust in lung tissue.

MILLER, J. W., and SAYERS, R. R. The Physiological Response of Peritoneal Tissue to Certain Industrial and Pure Mineral Dusts. Pub. Health Rep. 51, 49:1677 (Dec. 4), 1936.

When Shiga Talks about Dysentery It's News—Reminiscences of the discovery and the rise and fall of hopes for the eradication of bacillary dysentery by bacteriologic methods by the man who knows most about it, constitute an absorbing memoir replete with philosophic comment on bacteriology and epidemiology in general.

SHIGA, K. The Trend of Prevention, Therapy, and Epidemiology of Dysentery Since the Discovery of Its Causative Organism. New Eng. J. Med. 215, 26:1205 (Dec. 24), 1936.

Epidemiology of Pneumonia—Because it is a forceful reminder that pneumonococcus pneumonia is a communicable disease, much like meningococcus meningitis in its epidemiologic features, this paper should be read by all sanitarians. Its findings in regard to the carrier state give it additional importance.

SMILLIE, W. G. A Study of an Outbreak of Type II Pneumonococcus Pneumonia in the Veterans Administration Hospital at Bedford, Massachusetts. Am. J. Hyg. 24, 3:522 (Nov.), 1936.

ASSOCIATION NEWS

SIXTY-SIXTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
New York, N. Y.
October 5–8, 1937
HEADQUARTERS: HOTEL PENNSYLVANIA

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Elizabeth J. Smith, 351–8th Ave., N., Twin Falls, Idaho, Supervising Nurse, County Health Unit
Florence Stein, R.N., State Board of Health, Phoenix, Ariz., Chief Consultant Nurse
Philomena Supper, 523 W. 121 St., New York, N. Y., Director, Nursing Education, St. John's University

Epidemiology Section

N. Herbert Bailey, M.D., 291 Laurel St., Hartford, Conn., Epidemiologist, City Dept. of Health
Juan Basora-Defillo, M.D., C.P.H., Dept. of Health, San Juan, P. R., Medical Inspector, Bureau of Epidemiology
James A. Dolce, M.D., Walnut Ave., Glen Head, N. Y., Medical Inspector, Glen Head School
Mordecai L. Falick, M.D., District State Health Office, Gouverneur, N. Y., Epidemiologist-in-training, State Dept. of Health
Thomas Francis, Jr., M.D., Rockefeller Institute, 66 St. & York Ave., New York, N. Y., Member of Staff, International Health Division, Rockefeller Foundation
Daniel L. Morrissey, M.D., Room 329, State Office Bldg., Providence, R. I., Assistant Epidemiologist, State Dept. of Health
Thelma L. Shriver, Box 1325, Juneau, Alaska, Assistant to the Epidemiologist, Territorial Dept. of Health

Unaffiliated

Clifford C. Corkill, M.D., 705 Oakland, Ann Arbor, Mich., Student
Clarus Faubion, Division of Public Health, Boise, Idaho, Secretary to Director of Division of Laboratories
W. D. Gilmore, M.D., State Board of Health, Phoenix, Ariz., Tuberculosis Consultant
Julia A. Hill, 1290–8th St., Douglas, Ariz., Public Health Nurse, Cochise County Unit
Walter C. Levy, M.D., State Dept. of Health, Albany, N. Y., Epidemiologist-in-training
Arthur J. Logie, M.D., 3603 Richmond St., Jacksonville, Fla., Director, Bureau of Tuberculosis, State Board of Health
Millard F. Schaefer, M.D., 1208 Roosevelt Ave., Ann Arbor, Mich.—after Feb. 15, County Health Office, Gering, Nebr.
Charles D. Shields, M.D., 55 Shattuck St., Boston, Mass., Physician-in-training, N. Y. State Dept. of Health
Maurice J. Strauss, M.D., 41 Trumbull St., New Haven, Conn., Director, Municipal Venereal Disease Clinic
L. H. Van Buskirk, M.D., 683 E. Broad St., Columbus, Ohio, Assistant Clinical Professor of Medicine, Ohio State University
George P. Wilson, 1297½ Fair Ave., Columbus, Ohio
Connie R. Yerwood, M.D., 144 Hill St., Ann Arbor, Mich. (will become connected with Texas State Dept. of Health)

APPLICANTS FOR FELLOWSHIP

IN accordance with the By-laws of the Association, the names of applicants for Fellowship are officially published herewith. They have requested affiliation with the Sections indicated.

HEALTH OFFICERS SECTION

Harry E. Handley, M.D., New York, N. Y.

LABORATORY SECTION

Leo F. Ey, Columbus, Ohio
Roy F. Feemster, M.D., Dr.P.H., Jamaica Plain, Mass.

PUBLIC HEALTH EDUCATION SECTION

Roscoe C. Brown, D.D.S., Washington, D. C.
Grossi Hamilton-Francis, M.D., Norfolk, Va.
Reba F. Harris, M.A., Louisville, Ky.

FOOD AND NUTRITION SECTION

Milton E. Parker, Danville, Ill.

CHILD HYGIENE SECTION

Carroll E. Palmer, M.D., Ph.D., Washington, D. C.

EPIDEMIOLOGY SECTION

James A. Crabtree, M.D., Dr.P.H., Knoxville, Tenn.

1937 A.P.H.A. MEMBERSHIP LIST

Have you sent in the post card indicating how you wish your name to be listed in the new membership roster? If not, please mail it at your early convenience because we want the list to be as complete and up-to-date as possible.

NEWS FROM THE FIELD

RADIO LECTURES ON GROWTH OF THE CHILD

FUTURE lectures to be given during February and March, in the radio forum on the growth and development of the child, under the auspices of the National Congress of Parents and Teachers, the American Academy of Pediatrics, and the National Broadcasting Company, are to be given by the following speakers:

Edwin C. MacDowell, Sc.D.; Dr. Arnold L. Gesell; Walter R. Miles, Ph.D.; Walter J. Damrosch; John E. Anderson, Ph.D.; Dr. Bert I. Beverly; Carleton Washburne; Frank N. Freeman, Ph.D.; and David B. Dill, Ph.D.

The lectures are on the Blue network of the National Broadcasting Company every Wednesday from 4:00 to 4:30 P.M., Eastern Standard Time.

TUBERCULOSIS LABORATORY

A TUBERCULOSIS research laboratory has been established in Colorado Springs, to be operated by the Colorado Research Foundation assisted by scientists of the Colorado College.

The laboratory was financed by the city of Colorado Springs and the PWA.

INDIANA DEPARTMENT APPOINTS MOTION PICTURE OPERATOR

TO meet the increased demands of health organizations for visual education programs, the Indiana State Department of Health has secured the full-time services of a motion picture operator to assist in projecting lantern slides and other health programs.

Noble J. Smallwood, the appointee, will be available to all groups interested in health programs; there will be no charge for the service. The State Department asks that requests be sent in at least 2 weeks in advance of the date of the program.

INTERNATIONAL ASSOCIATION OF MILK SANITARIANS

BY amendment to their constitution, the name of the International Association of Dairy and Milk Inspectors has been changed to: International Association of Milk Sanitarians.

The following officers have been elected:

President: John G. Hardenbergh, V.M.D.,† of Plainsboro, N. J.

First Vice-President: Alexander R. Tolland, of Boston, Mass.

Second Vice-President: Dr. Paul B. Brooks,* of Albany, N. Y.

Third Vice-President: Victor M. Ehlers,* of Austin, Tex.

Secretary-Treasurer: C. Sidney Leete, of Albany, N. Y.

Auditors: Fred D. Holford, D.V.M.,† of New York, N. Y.; J. R. Jennings,* of Louisville, Ky.

ALLIED PROFESSIONS CONGRESS

REPRESENTATIVES of all professions allied in the delivery of medical care, including nurses, dentists, druggists, hospital executives, and members of the bar, are invited to an all-day (May 3) conference to be a feature of the 84th Annual Meeting of the Minnesota State Medical Association to be held in St. Paul, May 3–5. Morris Fishbein, M.D.† of the American Medical Association, will be one of the speakers.

AMERICAN CAMPING ASSOCIATION

THE Seventh National Convention of the American Camping Association is to be held in the Hotel Statler,

* Fellow A.P.H.A.
† Member A.P.H.A.

Detroit, February 4, 5, and 6. The topic for the meeting is "New Horizons for Camping." The American Camping Association has been given $100,000 by the Chrysler Fund for guiding the future developments in camping and to provide research and promotional plans which are being formulated.

FLORIDA ASSOCIATION OFFICERS

AN announcement from the Florida Public Health Association, Inc., of Jacksonville, Fla., states that the newly elected officers are as follows:

President: Wilbur A. McPhaul, M.D.,† Jacksonville

First Vice-President: Samuel D. Macready,† West Palm Beach

Second Vice-President: L. J. Graves, M.D., Tallahassee

Secretary-Treasurer: Stewart G. Thompson, D.P.H.,* Jacksonville

The 1937 annual meeting will be held in Tallahassee, Fla., possibly in December.

PERSONALS

DONALD G. EVANS, M.D.,† of Seattle, Wash., has been appointed Director of the State Department of Health, as of January 1. He has been Assistant Director. Formerly he was Director of the Division of Child Welfare of the Seattle Health Department, and then served for a short time as Director of the State Division of Maternal and Child Hygiene.

MILFORD E. BARNES, M.D., DR.P.H.* of Iowa City, Iowa, has been elected President of the Iowa Tuberculosis Association to fill the unexpired term of the late Dr. James A. Edwards, of Oakdale.

DR. THOMAS E. CAMPER,† of Camden, N. J., has been appointed Health Officer of Iron County, Mich.

B. BOOKER DALTON, M.D.,† of Rockingham, N. C., has resigned as Health Officer of Richmond County, to enter private practice in Liberty.

LAWRENCE WADE BASS, PH.D.,* recently Director of Research for the Borden Company, New York, has been appointed Assistant Director of the Mellon Institute of Industrial Research, where he was Executive Assistant from 1929 to 1931.

PAUL H. BROWN, M.D.,† Health Officer of East Haven, Conn., has been appointed Epidemiologist in the Bureau of Communicable Diseases, of the Connecticut State Department of Health, on a part-time basis. He succeeds John S. Cunningham, M.D.,† of Hartford, who is on leave of absence for 1 year at the Harvard School of Public Health.

THOMAS M. RIDDICK,† Consulting Chemist, of New York, N. Y., formerly associated with the late Nicholas S. Hill, Jr.,* has established laboratories for chemical and bacteriological analyses of water, sewage, and milk, and offices for supervision of operation of water and sewage treatment plants and swimming pools.

DR. HARRY A. STRIBLEY has been appointed to take charge of a new clinic for the treatment of venereal diseases opened in Dubuque, Iowa, December 1.

DR. ALFRED R. MASTEN was recently appointed by the Colorado State Board of Health as Director of the Division of Tuberculosis Control.

DR. HENRY J. DEAVER, of Sabetha, Kan., has been appointed Health Officer of Nemaha County, succeeding Dr. Frederick S. Deem, of Oneida, who resigned to become physician for a CCC camp at Kingman.

MARVIN F. HAYGOOD, M.D.,† recently Medical Director of the Georgia Emergency Relief Administration,

* Fellow A.P.H.A.
† Member A.P.H.A.

Atlanta, has been appointed Director of Local Health Services for the Iowa State Department of Health, Des Moines. He will also become Deputy Health Commissioner, succeeding Frederick J. Swift, M.D.,† who resigned to become Superintendent of the Iowa Soldiers Home, Marshalltown, Iowa.

E. V. MCCOLLUM, Sc.D.,* of Baltimore, Md., has been appointed a member of the U.S.P. Vitamin Advisory Board, succeeding the late Lafayette B. Mendel, D.Sc.

HERMAN S. GOVE, M.D.,† of Linn, Mo., since 1934 Director of the Department of Child Hygiene, of the Missouri State Department of Health, has been appointed Health Commissioner of Missouri, succeeding Elmer T. McGaugh, M.D.,† resigned.

DR. DEWEY L. ANDERSON, of Sanatorium, Miss., has been appointed Clinician with the field tuberculosis diagnostic unit of the Mississippi State Board of Health.

DR. ALWIN M. CLARKSON, of Dallas, Tex., has been appointed Epidemiologist to the State Department of Health, to succeed Dr. Charles D. Reece, of Austin, resigned.

GEORGE W. COX, M.D.,† of Del Rio, Tex., has been appointed State Health Officer, succeeding John W. Brown, M.D.,* of Austin.

DR. JOHN B. KISTLER, of Newcomerstown, Ohio, has been appointed Medical Inspector in the Division of Communicable Diseases of the State Department of Health.

DR. JOHN W. FERREE, of Bluffton, Ind., has been appointed chief of the newly created bureau of local health administration, of the Indiana State Division of Public Health.

DR. WILLIAM M. TROTTER, formerly of Maxwell, Iowa, has been appointed director of the first public health district in Iowa, which has been organized as District No. 1, comprising Counties of Lyon, Osceola, Sioux, Plymouth, O'Brien, and Cherokee.

* Fellow A.P.H.A.
† Member A.P.H.A.

DEATH

JOHN THAMES, M.D.,* Director of the Kanawha County Health Unit, Charleston, W. Va., died January 11. As Secretary of the West Virginia Public Health Association, he served on the Governing Council of the A.P.H.A. from February, 1934. He became a member in 1919 and was elected a Charter Fellow in 1922.

CONFERENCES AND DATES

American Public Health Association —66th Annual Meeting. Hotel Pennsylvania, New York, N. Y. October 5–8.

American Association of the History of Medicine. Atlantic City, N. J. May 3–5.

American Association for the Advancement of Science. Denver, Colo. June 21–26.

American Camping Association—Seventh National Convention. Hotel Statler, Detroit, Mich. Feb. 4–6.

American Chemical Society. Chapel Hill, N. C. April 12–15.

American Physical Education Association. New York, N. Y. April 21–24.

American Heart Association. Atlantic City, N. J. June 7–11.

American Medical Association—Eighty-eighth Annual Session. Atlantic City, N. J. June 7–11.

American Radium Society. Atlantic City, N. J. June 7–8.

American Society for Clinical Investigation. Atlantic City, N. J. May 3.

American Society for the Control of Cancer. Campaign of Education Throughout the United States. March.

American Society of Heating and

Ventilating Engineers—Semi-Annual Meeting, 1937. New Ocean House, Swampscott, Mass. June 24–26.

American Society of Medical Technologists. Atlantic City, N. J. June 7–9.

American Therapeutic Society. Atlantic City, N. J. June 4–5.

American Water Works Association—Four States Section. Philadelphia, Pa. April.

Arizona State Public Health Association. Phoenix, Ariz. April 7–9.

California Tuberculosis Association. Riverside, Calif. April 5–6.

Canadian Public Health Association. Chateau Laurier, Ottawa, Ont. June 17–19.

Canadian Tuberculosis Association. Chateau Laurier, Ottawa, Ont. June 17–19.

First International Conference on Fever Therapy. Columbia University, New York, N. Y. March 29–31.

First National Social Hygiene Day. February 3.

Medical Education, Medical Licensure and Hospitals—Annual Congress. Chicago, Ill. Feb. 15–16.

Minnesota State Medical Association. St. Paul, Minn. May 3–5. (Congress of Allied Professions, May 3.)

Mother's Day. May 9.

National Association of State Directors of Educational Research. New Orleans, La. February 20–25.

National Conference of Social Work. Indianapolis, Ind. May 23–29.

National Congress of Parents and Teachers. 40th Anniversary Celebration. February 17.

National Tuberculosis Association. Milwaukee, Wis. May 31–June 3.

National Tuberculosis Association—Los Angeles Institute for the Training of Tuberculosis Workers. Los Angeles, Calif. June 15–30.

National Tuberculosis Association—New York Institute for the Training of Tuberculosis Workers. New York University (Washington Square), New York, N. Y. February 8.

New England Health Education Association. Annual Meeting. Massachusetts Institute of Technology, Cambridge, Mass. June 4–5.

New York Heart Association (Heart Committee of the New York Tuberculosis and Health Association). New York Academy of Medicine, New York, N. Y. February 9.

Ontario Health Officers' Association. Chateau Laurier, Ottawa, Ont. June 17–19.

Regional Conference on Social Hygiene. Pennsylvania Hotel, New York, N. Y. February 3.

Rocky Mountain Medical Conference. Denver, Colo., July 19–21.

Smoke Prevention Association. New York, N. Y. June.

Society of State Directors of Physical and Health Education. New York, N. Y. April 21–24.

Surgeon Generals' Conference. April.

Western Branch, American Public Health Association—Eighth Annual Meeting. Phoenix, Ariz. April 7–9.

FOREIGN

Fifth International Congress of Hospitals. Paris, France. July 6–11.

British Medical Association. Belfast, Ireland. July 20–25.

Seventh Biennial Conference, Health Section of the World Federation of Education Associations. Tokyo, Japan. August 2–7.

Fourth International Pediatric Congress. Rome, Italy. September 24–30.

Second International Congress for the Protection of Infancy. Rome, Italy. October 4–8.

Gifts and Bequests

The American Public Health Association is the technical society of professional public health workers. It is not endowed. It derives its income from membership fees, its publications and business services, and from grants for special purposes.

As the recognized and respected coördinator and leader of the public health movement on the North American continent, the American Public Health Association offers opportunities of the highest order to those who through financial good-fortune and personal inclination are in a position to make funds available for human welfare.

▼

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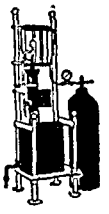
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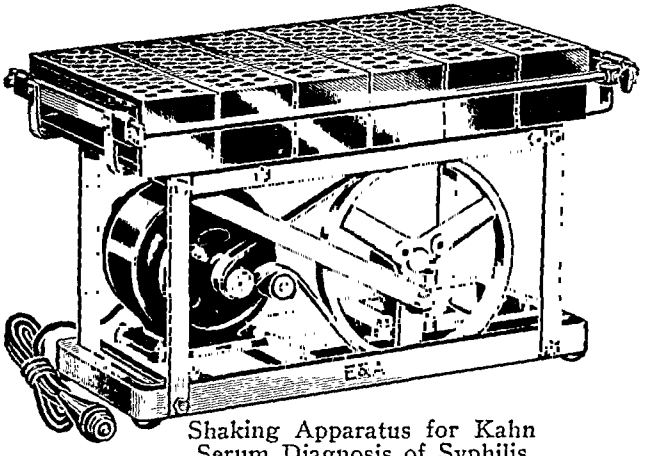


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Physical Defects—The Pathway to Correction (American Child Health Association)	1.25
Standard Methods for Examination of Water and Sewage (8th ed.) (American Public Health Association)	2.50

Order from the Book Service

The American Public Health Association

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MEETINGS OF AFFILIATED SOCIETIES
and A. P. H. A. Branches

Society	*Secretary*	*Place and Time of Annual Meeting*
Connecticut Public Health Assn.	Ira V. Hiscock	May, 1937
Florida Public Health Association	S. G. Thompson, D.P.H.	Tallahassee, Fla., December, 1937
Georgia Public Health Association	M. E. Winchester, M.D.	To be announced
Massachusetts Public Health Assn.	G. Donald Buckner, S.B.	To be announced
Michigan Public Health Association	Marjorie Delavan	Lansing, Nov. 10–12
Missouri Public Health Association	Dr. C. F. Adams	Springfield, April 29–30
New Mexico Public Health Assn.	Paul S. Fox	To be announced
Northern California Public Health Association	Dr. I. O. Church	March, 1937
Ohio Federation of Public Health Officials	W. D. Bishop, M.D.	November, 1937
Pennsylvania Public Health Assn	J. M. J. Raunick, M.D.	To be announced
Public Health Association of New York City	Frank Kiernan	To be announced
South Carolina Public Health Assn	Laura Blackburn	To be announced
Southern California Public Health Association	Charles W. Arthur	To be announced
Texas Public Health Association	P. A. Kerby	October, 1937
Virginia Public Health Association	B. B. Bagby, M.D., Pres.	To be announced
West Virginia Public Health Assn		October, 1937
Southern Branch, American Public Health Association	G. Foard McGinnes, M.D.	To be announced
Western Branch, American Public Health Association (joint meeting with Arizona Public Health Association)	William P. Shepard, M.D.	Phoenix, Ariz., April 7-9

Application for Membership

I wish to apply for membership in the American Public Health Association.

Name
Print name in full and give degree

Street and City..... State.....
For correspondence and the Journal

Present public health occupation.....

REQUIREMENTS: Persons professionally engaged or interested in public health work are eligible for election as Members of the Association.

DUES: Dues of Members are $5.00 per year, which includes an annual subscription to the **AMERICAN JOURNAL OF PUBLIC HEALTH.** Persons joining the Association after July 1 are requested to pay $7.50, covering a year and one half from July, 1936, to December, 1937.

AMERICAN PUBLIC HEALTH ASSOCIATION

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Positions Wanted

HEALTH OFFICERS

Physician, M D University of Wisconsin, M P H Harvard School of Public Health, Special courses in industrial hygiene, available now for an administrative position or one in industrial hygiene A-279

M D desires position as health officer Has been city and school physician for four years A-280

Young physician, M D Johns Hopkins University, M P H Harvard School of Public Health, experienced in city health department administration and hospital management will consider outstanding position in the Eastern states A 286

Physician, M D, Medico Chirurgical, Philadelphia, 4 years Army Medical Corps, 10 years full time county health officer 5 years' field experience in syphilis control, desires position as venereal disease control officer in a state or municipality which is seriously interested in the control of syphilis A-284

Physician, M D University of Minnesota with post graduate training in public health and experience as deputy and epidemiologist in large city department of health, will consider administrative position communicable disease or venereal disease administration at salary not less than $4 800 A 287

Physician, M D Indiana University, C P H Johns Hopkins University, special courses in epidemiology, biostatistics and public health administration, several years' experience as physician to city health department desires position as full time county health officer A 269

Physician, M D University of Maryland School of Medicine and C P H Johns Hopkins University, nine years' experience as county and school health officer, desires position as director of a county or district with headquarters in a city A 265

CHILD HYGIENE

Pediatrician graduate Columbia College of Physicians and Surgeons 1912, with excellent background of practical and administrative experience in large city health department, will consider position of teaching or administration in child hygiene C 288

Young woman, M D Yale 1930 Dr P H Yale, excellent background teaching and child hygiene administration, state and local, will consider an exceptional opportunity preferably in the East C 289

Physician, M D University of Iowa with experience as state director of child hygiene and with a background of health education, has been full time city health officer and teacher in Class A medical school, is available for position paying $5 000 per annum C-290

PUBLIC HEALTH ENGINEER

Public Health Engineer, graduate of M I T with B S in Public Health Engineering, desires position Has served as assistant county and state sanitary engineer, and as assistant areal supervisor of occupational morbidity and mortality study, Office of Industrial Hygiene and Sanitation, U S P H S E 283

MISCELLANEOUS

Experienced research microbiologist, Ph D Western Reserve, will consider position in public health laboratory service or university teaching M-291

Graduate, University of Michigan, M S, experienced in Public Health Service health inventory, will consider administrative offer in a health department M 292

Physician, M D Northwestern, Dr P H Johns Hopkins, broad experience in laboratory, teaching and epidemiological fields now engaged in Eastern department of public health, will consider part time assignments during first half of 1937 M-293

Young woman Ph D Columbia University, splendid background of experience in health education, will consider position in Eastern states in university or promotional agency M 294

Young woman experienced statistical worker with background of newspaper work, desires position S 285

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Michigan Sewage Works Association
Missouri Water and Sewerage Conference
New England Sewage Works Association
New Jersey Sewage Conference
New York State Sewage Works Association
North Carolina Sewage Works Association
Ohio Sewage Works Conference
Oklahoma Water and Sewage Conference
Pacific Northwest Sewage Works Assn.
Pennsylvania Sewage Works Association
Rocky Mountain Sewage Works Assn.
Sanitary Engineering Division of Argentine Society of Engineers
Sewage Division, Texas Section, S. W. W. A.
The Canadian Institute on Sewage and Sanitation
The Institute of Sewage Purification—England
The Institution of Sanitary Engineers—England

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CONSERVATION OF ESSENTIAL ELEMENTS IN PROTECTIVE FOODS

II. THE VITAMINS

● Refinement of vitamin assay methods has made practical many quantitative studies which had hitherto been impossible. Employment of these methods has yielded evidence which indicates that many factors may influence the vitamin content of foods which come to the table; in particular the fruits and vegetables. Variety, maturity, time and temperature of storage after harvesting, and method of preparation, all have been found to affect the ultimate vitamin content of common foods. Several examples of the extent to which certain of these factors operate might well be given.

It has been shown that spinach slowly loses its vitamin C potency even in low temperature storage; at room temperature, one-half of the vitamin C is lost in three days; practically all antiscorbutic potency disappears in seven days (1).

Another report indicates a loss in vitamin C of 78 per cent in spinach stored two days at room temperature and 80 per cent loss in asparagus tips during four days' storage (2).

The vitamin C content of apples is markedly reduced during cold storage: 20 per cent in 4 to 6 months and about 40 per cent in 8 to 10 months (3).

Vitamin A in apples is, however, subject to less destruction than vitamin C during prolonged storage (4).

Prolonged cold storage of pears may result in a loss in the vitamin A and vitamin C content of nearly 50 per cent (5).

Further, solution losses which may occur during cooking vary with the individual product and with the method used in cooking. From 40 to 48 per cent of vitamin C may be lost to the water in which peas are cooked (6).

Vitamin C losses in 12 different vegetables have been reported to vary from 12 per cent in asparagus to 80 per cent in white onions (7).

These data demonstrate the seriousness of solution losses of vitamin C. It is considered probable that other water soluble vitamins are affected in a similar way.

Thus, by the time fruits and vegetables spend some days in transit or storage before reaching the kitchen and are cooked by the usual home method, much of the original vitamin content may have been lost. Little can be done to prevent storage losses when fresh fruits and vegetables are not available from the home garden, but solution losses may in part be overcome by using the cooking water.

Fortunately, in the commercial canning procedure, products are harvested at the optimum stage of maturity and canned immediately, using only a limited quantity of water which is retained in the can. As a result, storage losses of the vitamins are reduced (8), and solution losses may be eliminated by the use of the liquid in which the food is canned.

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(1) 1936. Food Research 1, 1.
(2) 1936. J. Soc. Chem. Ind. 55, 153T.
(3) 1933. J. Agr. Res. 46, 1039.
(4) 1936. Food Research 1, 121.
(5) 1934. J. Am. Diet. Assn. 10, 217.
(6) 1936. J. Nutrition 12, 285.
(7) 1936. J. Home Econ. 28, 15.
(8) a. 1921. Proc. Soc. Exp. Biol. Med. 18, 164
b. 1928. Ind. Eng. Chem. 20, 202
c. 1929. Ibid. 21, 347
d. 1932. J. Home Econ. 24, 626

This is the twenty-first in a series of monthly articles, which will summarize, for your convenience, the conclusions about canned foods which authorities in nutritional research have reached. We want to make this series valuable to you, and so we ask your help. Will you tell us on a post card addressed to the American Can Company, New York, N. Y., what phases of canned foods knowledge are of greatest interest to you? Your suggestions will determine the subject matter of future articles.



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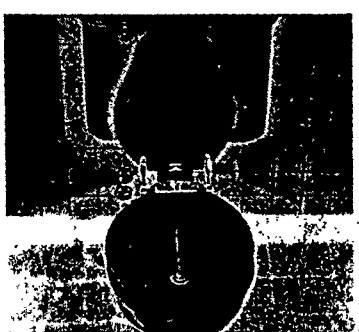


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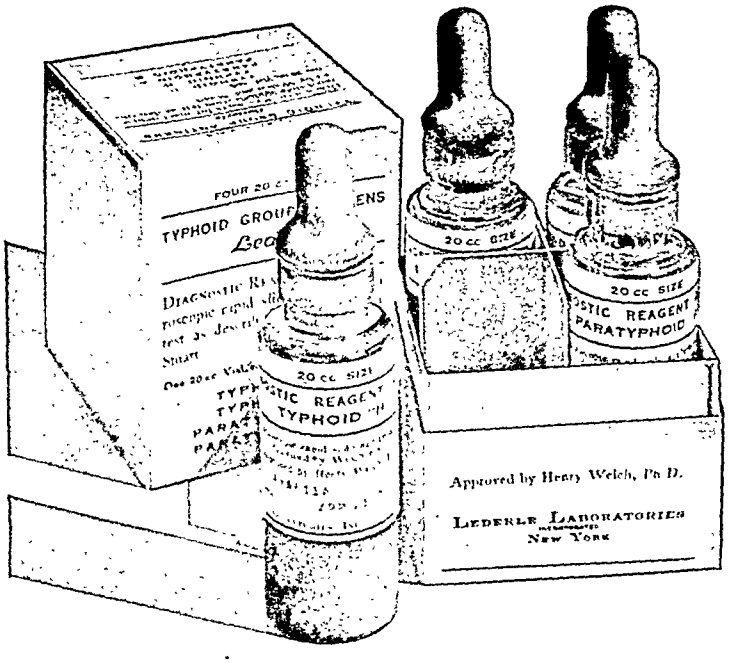
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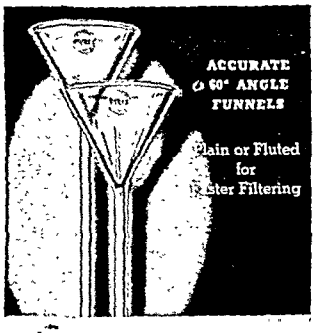
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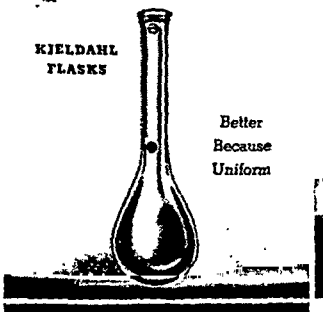
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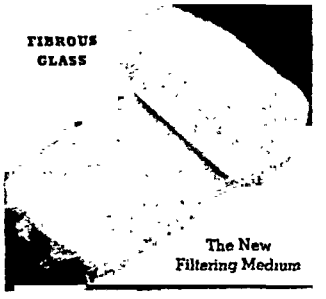
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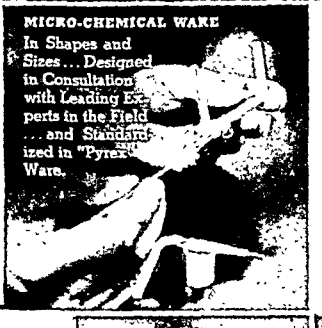
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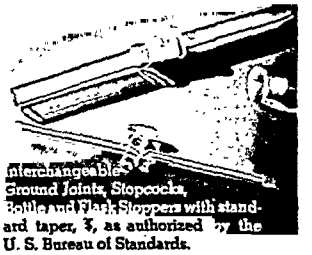
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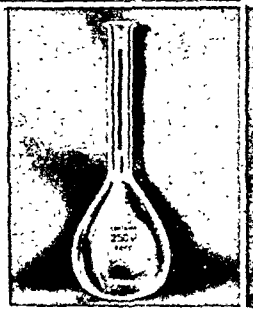
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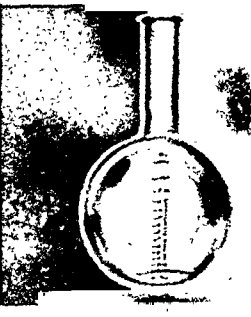
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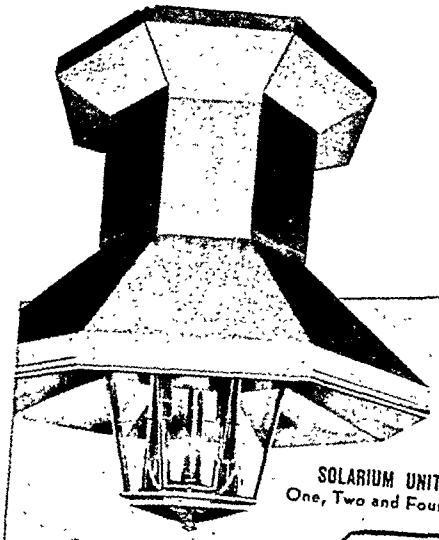
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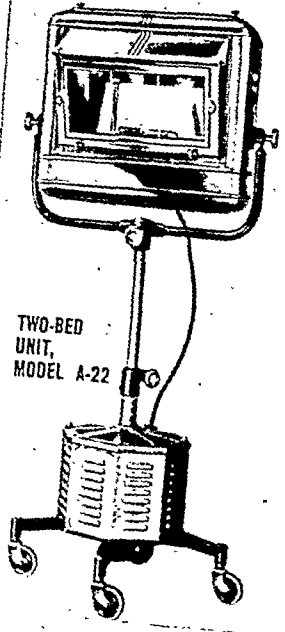
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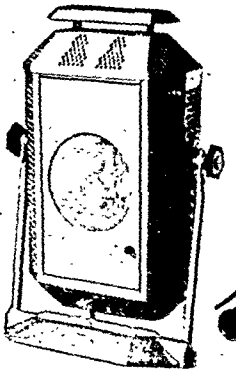
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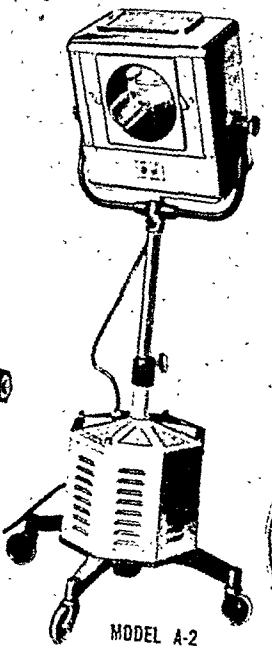
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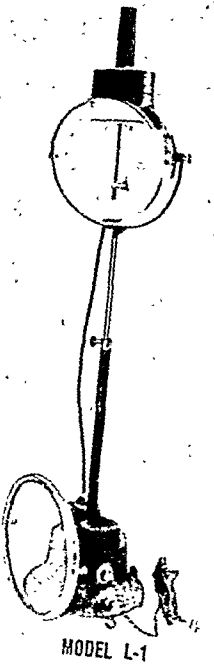
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Florida Public Health Association	S. G. Thompson, D.P.H.	Tallahassee, Fla., December, 1937
Georgia Public Health Association	M. E. Winchester, M.D.	To be announced
Massachusetts Public Health Assn.	G. Donald Buckner, S.B.	To be announced
Michigan Public Health Association	Marjorie Delavan	Lansing, Nov. 10–12
Missouri Public Health Association	Dr. C. F. Adams	Springfield, April 29–30
New Mexico Public Health Assn. (meeting with Western Branch, A.P.H.A.)	Paul S. Fox	Phoenix, Ariz., Apr. 13–15
Northern California Public Health Association	Dr. I. O. Church	To be announced
Ohio Federation of Public Health Officials	W. D. Bishop, M.D.	Columbus, November, 1937
Pennsylvania Public Health Assn.	J. M. J. Raunick, M.D.	To be announced
Public Health Association of New York City	Frank Kiernan	To be announced
South Carolina Public Health Assn.	Laura Blackburn	Myrtle Beach, May, 1937
Southern California Public Health Association	R. L. Kaufman, M.D.	To be announced
Texas Public Health Association	P. A. Kerby	El Paso, October, 1937
Virginia Public Health Association	B. B. Bagby, M.D., Pres.	To be announced
West Virginia Public Health Assn.	Dr. Edwin Cameron	October, 1937
Southern Branch, American Public Health Association	G. Foard McGinnes, M.D.	To be announced
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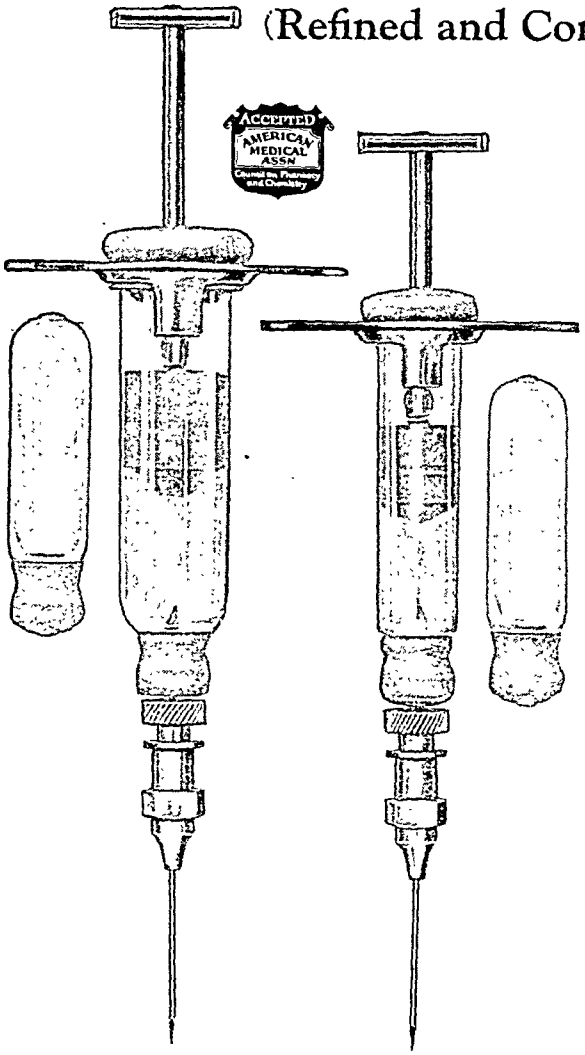
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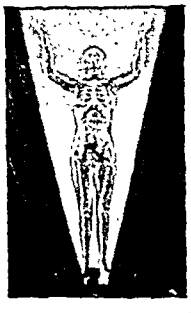


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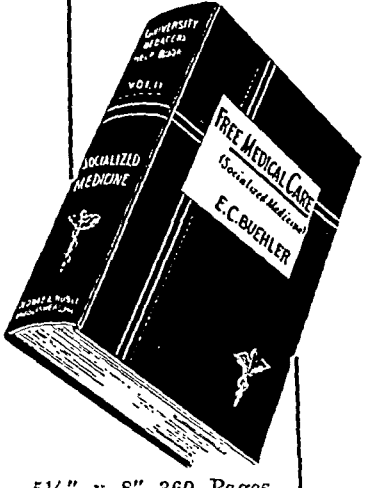
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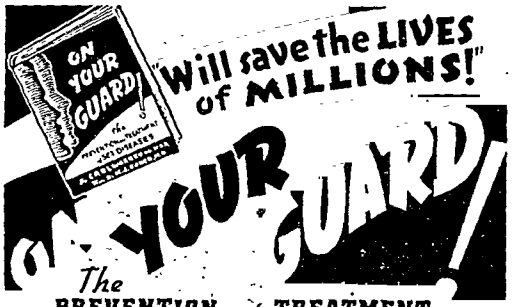
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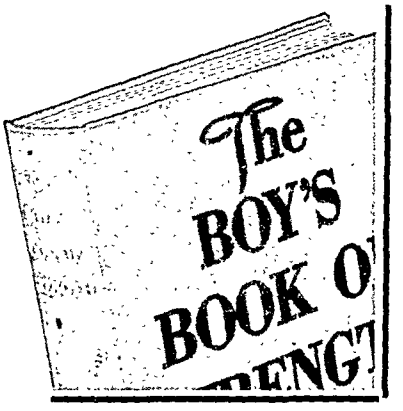
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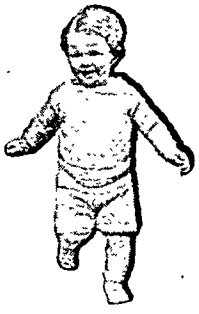
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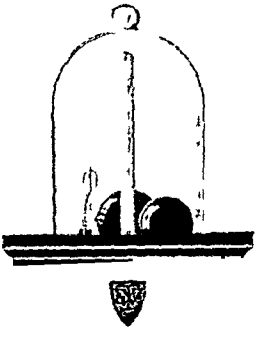
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American Journal of Public Health
and THE NATION'S HEALTH

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Control of Septic Sore Throat*

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THE control of streptococcic infections is a significant part of the duties of any health officer. There are no authentic records as to the number of cases of infections traceable directly or indirectly to streptococci; however, from reports available from the U. S. Treasury Department, it may be noted that since 1925 there have been more than 2,000,000 cases of scarlet fever in the United States and more than 53,000 reported cases of septic sore throat. These two types of infections, both reportable in most states, give some indication of the importance of these streptococcus infections from a public health viewpoint.

The control of scarlet fever and septic sore throat has constituted a serious problem, particularly in certain sections of the country. The available figures on these two diseases are somewhat confusing as practitioners are generally agreed that there is considerable difficulty in arriving at a differential diagnosis between certain of the less typical cases of septic sore throat, and scarlet fever, especially when both are associated with the same epidemic. The wide variation in the mandatory criteria for the diagnosis of septic sore throat being reported also introduces considerable question into the available figures. Certain states require the reporting as septic sore throat of all cases in which beta hemolytic streptococci are found on throat swabs, while others require clinical manifestations before a positive diagnosis of septic sore throat is permissible for reporting. For these reasons the available figures in the reported cases of septic sore throat, and in some measure scarlet fever, are open to criticism.

There are certain states, particularly New Jersey, in which septic sore throat is not a reportable disease. In this instance, a number of the septic sore throat cases are probably reported as scarlet fever. On the other hand, in some of the southern states, the reported cases of septic sore throat are sufficiently high to indicate that either considerable stress has been laid upon the reporting of this particular infection, or there is some confusion in the

* Read before the Health Officers Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936. Approved by the Director of the New York State Agricultural Experiment Station for publication as Journal Paper No. 170, 1936.

differential diagnosis. For these reasons it is difficult to determine the true incidence of scarlet fever, and, more particularly, septic sore throat in the United States.

Certain investigators have reported septic sore throat and scarlet fever to be more common in the northern than in the southern states and the conclusion has sometimes been drawn that the incidence of scarlet fever and septic sore throat varies with climatic conditions in the different sections of the country.

A study of the records of the U. S. Treasury Department from 1925 to 1934 indicates that the reported number of cases of scarlet fever and septic sore throat may be lower in the southern states than in certain of the northern districts. However, when this incidence is considered in light of the density of population, it may be found that in the main scarlet fever and septic sore throat are as prevalent in the southern states as in the more northern.

From a study of the latest census report, particularly from the standpoint of the 9 districts recognized as geographical districts by the Census Bureau, it may be found that there are real correlations between the incidence of scarlet fever and certain factors connected with the distribution of population in these districts. If the incidence of scarlet fever, based on cases per 1,000, is compared with the urban population of the 9 sections, it is found (Graph I), generally speaking, that an increased urban or city population in any particular district is accompanied by an increase in the cases per 1,000. This correlation is subject to criticism because of possible inaccuracy in the figures and also because the correlation is not exact. However, it becomes evident that by arranging the 9 districts on the basis of the per cent of the total population included in cities of 2,500 (urban) and over, there is a correlating increase in the cases per 1,000 of scarlet fever. One noticeable exception centers in the Pacific coast section which includes Washington, Oregon, and California. It can be seen from the reported figures that the incidence of scarlet fever in the Pacific coast states is relatively low, even if the urban population is taken into consideration.

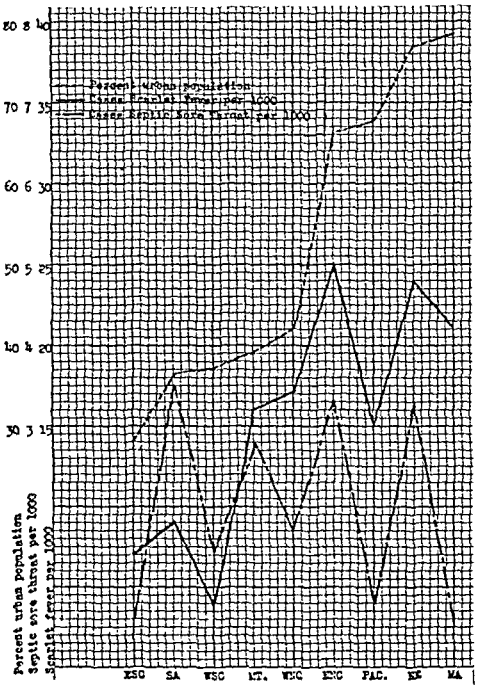
The lowest number of cases (Table I) per 1,000 of scarlet fever appears to be in the southern states, particularly the South Atlantic, East South Central, and West South Central districts. The more northern states which are included in the Middle Atlantic, New England, and East North Central districts have

TABLE I

Relation of Septic Sore Throat and Scarlet Fever to Per Cent Urban Population

Section of United States	Per Cent Urban Population	Cases per 1,000 (10 Yrs.)		Deaths per 1,000 (10 Yrs.)	
		Septic Sore Throat	Scarlet Fever	Septic Sore Throat	Scarlet Fever
New England	77.3	3.386	24	0.108	0.216
Middle Atlantic	77.7	0.513	21	0.079	0.190
East North Central	66.4	3.378	25	0.155	0.360
West North Central	41.8	1.723	17	0.085	0.251
South Atlantic	36.1	3.783	9	0.088	0.124
East South Central	28.1	0.689	7	0.017	0.134
West South Central	36.4	1.450	4	0.134	0.091
Mountain	39.4	2.894	16	0.104	0.216
Pacific	67.5	0.891	15	0.027	0.125

GRAPH I—RELATION OF SEPTIC SORE THROAT AND SCARLET FEVER TO URBAN POPULATION



ESC — East South Central
Kentucky, Tennessee, Alabama, Mississippi

SA — South Atlantic
Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida

WSC— West South Central
Arkansas, Louisiana, Oklahoma, Texas

MT. — Mountain
Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada

WNC— West North Central
Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas

ENC — East North Central
Ohio, Indiana, Illinois, Michigan, Wisconsin

PAC.— Pacific
Washington, Oregon, California

NE — New England
Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut

MA — Middle Atlantic
New York, New Jersey, Pennsylvania

an appreciably higher rate. From these figures, which are not entirely accurate, it seems safe to draw the general conclusion that the incidence of scarlet fever shows some relation to the percentage of urban population.

It is generally recognized by epidemiologists that scarlet fever is primarily a contact disease, which partly explains the higher rate per 1,000 in the larger population centers. On the other hand, it is the experience of those who have studied septic sore throat that it spreads from a common source of infection and not through contact. Repeated observations in milk-borne epidemics of septic sore throat have shown that one member of the family may be infected, and in only a small percentage of instances is the infection spread through the family unless they have used the infected milk. In epidemics in New York State with 75 to 300 reported cases and directly traced to milk carrying the responsible streptococci, only from 3 to 10 cases can be accounted for through contact. It is evident that scarlet fever and septic sore throat in the main are spread by different methods.

A study of the relation of the incidence of septic sore throat to urban population (Graph I) more definitely indicates this difference. From figures now available, it is evident that there is no correlation between the number of cases of septic sore throat reported and the percentage of urban population, and it can be noted that from year to year there is a decided variation in the number of reported cases in any particular district. This is in contrast to the rather constant number reported annually for a given district for scarlet fever.

There is a great variation in the reporting of septic sore throat in the various states. Certain states report large numbers and others only a few cases. A study of the cases per 1,000

(Table I) as reported for the different districts of the United States indicates that certain sections either have a low rate of septic sore throat, are failing to report all of the cases, or are not conforming with generally accepted practice with regard to criteria of diagnosis. Of particular note in this connection is the Middle Atlantic section which includes New York, New Jersey, and Pennsylvania. In New York State particular effort has been made to report all cases of septic sore throat and, in addition, to exhaust the possibilities of incriminating raw milk supplies. In New Jersey, included in this same district, septic sore throat is not reportable. For this reason, the Middle Atlantic section as a whole shows a very low rate per 1,000 for septic sore throat. Certain other districts are of interest in light of a general belief that the incidence of septic sore throat is lower in the southern states than in the more northerly sections. The rate per 1,000 for 10 years in the New England states is 3.3, in the South Atlantic states 3.7 per 1,000.

Reference should be made in this connection again to the Pacific coast states, Washington, Oregon, and California, with reference to their extremely low rate of septic sore throat. Only 2 other districts, which include states in which septic sore throat is a reportable disease, have as low rate per 1,000.

These figures indicate that septic sore throat cannot be correlated with urban population, with village population, or with the rural population in any of the given districts; nor can it be found that septic sore throat is confined to any section of the United States based on climatic or temperature conditions. In certain sections of the southern parts of the country the incidence is as high or higher than the more northern states.

Although over 53,000 cases of septic sore throat have been reported in the United States in the last 10 years, only 12,430 cases in 129 epidemics have been traced directly to milk supplies. It is evident, as pointed out by Brooks (1933),[1] that there are in all probability a large number of missed epidemics in various sections of the country. The missing of these epidemics may be due to several causes. Physicians may not be called in, or health officers in smaller communities may not have been properly advised as to the epidemiological significance of milk in connection with these cases of septic sore throat. This is particularly true in light of the observation that septic sore throat is not primarily a contact infection but is due to some common source which carries the infection, such as milk.

TABLE II

Septic Sore Throat in States Not on Record as Reporting Milk-borne Epidemics

State	*Number of Cases*	*Cases per 1,000 (10 Yrs.)*
Alabama	102	0.046
Arizona	60	0.060
Colorado	95	0.095
Delaware	36	0.151
Florida	334	0.238
Idaho	69	0.155
Illinois	1,175	0.154
Kansas	634	0.352
Kentucky	913	0.351
Louisiana	328	0.156
Maryland	1,296	0.800
Michigan	3,999	0.814
Mississippi	5	0.002
Missouri	2,256	0.066
Montana	359	0.668
Nebraska	1,156	0.889
Nevada	20	0.022
New Mexico	150	0.354
North Dakota	75	0.110
Oklahoma	2,555	1.110
Rhode Island	222	0.323
South Carolina	84	0.050
South Dakota	99	0.140
Tennessee	754	0.290
Vermont	167	0.470
Washington	92	0.061
Wyoming	192	0.850

Twenty-seven states have reported no milk-borne epidemics of septic sore throat since 1925. An analysis of the reports of septic sore throat (Table II) in these 27 states indicates that the incidence of infection is relatively high in several. Over 1,100 cases have been reported in Illinois, nearly 4,000 in Michigan, and over 2,500 in Oklahoma. Some other states have a comparable incidence of infection. It has been noted that in certain cases from 0.8 to 1.1 cases per 1,000 have been reported during the past 10 years, but no epidemics in which raw milk is involved have been considered as the source.

The reports from some of the eastern states, particularly New York, contrast sharply with those from the states which have not reported septic sore throat epidemics. In New York a rather extensive educational campaign has been under way and a large percentage of the health officers have been so instructed that they are constantly on the alert to connect their reported cases with milk supplies. More epidemics of septic sore throat than any other state—a total of 35 epidemics, approximately 2,700 cases—have been reported. The definite connection of these with milk-borne epidemics materially lowers the number of cases based on rate per 1,000 which are reported whose cause is unknown. It is reasonable to believe that if the same practice was followed in states not reporting septic sore throat epidemics that a similar condition would be found.

Although septic sore throat is not associated with any particular type of population, an analysis of the 60 epidemics about which we have some definite information (Table III) indicates that the majority of these have occurred in smaller communities. This is particularly true in New York in which during recent years the epidemics have been associated, with few exceptions, with rural regions in which the milk supply has not been pasteurized. Of these epidemics only 2 have been reported as traced to pasteurized milk, and in 1 the milk was reported as being improperly pasteurized.

TABLE III

Population of Cities or Villages in Which 60 Septic Sore Throat Epidemics Occurred During the Last 10 Years

Population	*Number of Epidemics*	*Number of Epidemics from Raw Milk*
2,500 or less	26	26
2,500 to 10,000	18	18
10,000 to 100,000	14	12
100,000 or more	2	2

It is therefore concluded that septic sore throat in the main is traced to raw milk supplies in the districts in which an active campaign is made to study more carefully the source of infection. It is also safe to postulate that the incidence of septic sore throat might be materially lowered in other sections if a more careful study was made of cases to determine whether a raw milk supply might be incriminated.

Considerable investigation has been made of the cause and epidemiology of septic sore throat. The definite connection of the human types of pyogenic streptococci with septic sore throat and scarlet fever immediately brought into bold relief the public health significance of udder infections, particularly mastitis. Some believed that all cases of bovine mastitis (inasmuch as this particular infection is caused by streptococci) might be responsible for septic sore throat. Subsequent work has indicated that the organism responsible for septic sore throat epidemics is entirely distinct from the streptococcus associated with ordinary bovine mastitis, in which the bovine streptococcus is passed from cow to cow and remains indef-

TABLE IV

Occurrence of Hemolytic Streptococci in Udder of Cow 17661

Date	Quarters L.H.	R.H.	L.F.	R.F.
1929				
Mar. 16	Many colonies *	—	—	—
Mar. 21	Many colonies	—	—	—
Mar. 27	Few colonies	—	—	—
Apr. 16	—	—	—	—
June 10 †	—	—	—	—
July 16	—	—	—	—
Aug. 8	—	—	—	—
Aug. 12	Four colonies ‡	—	—	—
Aug. 21	—	—	—	—
Sept. 3	—	—	—	—
Sept. 10	—	—	—	—
Sept. 18	—	—	—	—
Oct. 2	—	—	—	—
Oct. 16	—	—	—	—
Nov. 1	—	—	—	—
1930				
Jan. 6	—	—	—	—
Feb. 4	—	—	—	—

* Isolated *Streptococcus pyrogenes* 1276 C.
† New lactation
‡ All proved to be *Streptococcus agalactiae*.

initely in the mammary tissue. When the udder is infected with the human type of pyogenic streptococcus, the organism is not passed from cow to cow and generally (Table IV) does not remain for any length of time in the udder. Observations on a particular cow which was responsible for the septic sore throat outbreak at Savannah, N. Y., showed that although a large number of these human pyogenic types were isolated from the udder during and just subsequent to the epidemic, the number of organisms gradually decreased and after a few weeks the milk was found to be free of this type of beta hemolytic streptococcus. No other cows in the herd were infected with this organism. In addition to the selective infecting tendencies, there are many cultural characteristics which separate the typical bovine mastitis streptococcus from the human pyogenic type (Table V).

By laboratory study, certain well defined groups of beta hemolytic streptococci can be readily distinguished. This is an important point if an intelligent attitude is to be adopted toward dairymen when a septic sore throat epidemic is being investigated. Health officers should instruct their laboratory directors to be especially careful in properly identifying the streptococcus and in making sure that it is of the human pyogenic type rather than the

TABLE V

The More Important Groups of Beta Hemolytic Streptococci

Type	Precipitin Group	Produces Acid from Sorbitol	Trehalose	Lactose	Attacks Sodium Hippurate	Final H-ion Concentration Production	Survive Pasteurization Temperature	Remarks
Streptococcus pyogenes	A	—	+	+	—	pH 4.8 to 5.2	—	Pathogenic to humans
Bovine mastitis streptococcus	B	—	+	+	+	pH 4.4 to 4.6	—	Probably associated only with bovine udder
Animal pyogenes	C	+	—	+	—	pH 4.7 to 4.9	—	With few exceptions only pathogenic for lower animals
Animal (horse) pyogenes	C	—	—	—	—	pH 4.8 to 5.0	—	Pathogenic for horses
Beta hemolytic from pasteurized milk				+	+	pH 4.0 to 4.4	+	

TABLE VI

Per Cent of Cows Which Show Pathological Changes as Evidenced by Physical and Laboratory Examination of the Milk

	Per Cent Showing					
Total Number of Cows Examined	*Abnormal Milk*	*Long Chained Streptococci Upon Direct Microscopic Examination of Milk*	*Streptococci in Milk by Cultural or Other Methods*	*Leucocyte Count Greater than 500,000 per c.c.*	*Positive Brom Thymol Blue Reaction*	*Presence of Fibrotic Tissue*
7,000	4	4.5	45	25	20	60

ordinary bovine mastitis streptococcus. The latter is commonly present in udders.

At the outbreak of an epidemic of septic sore throat, although cows with definite clinical cases of mastitis should be under suspicion, the mere presence of udder infection is not proof that any particular cow is incriminated. A study of some 7,000 cows (Table VI) indicates that about 4 per cent will intermittently produce milk which is abnormal in appearance as a result of a clinical case of mastitis and about 45 per cent will discharge long chain streptococci in the milk. However, in all of these cases the type of streptococcus shows that it is of bovine origin and that it has no public health significance as a cause of scarlet fever or septic sore throat.

In studying epidemics of septic sore throat, some health officers have incriminated pasteurized milk because laboratories may have reported the presence of beta hemolytic streptococci. A group of beta hemolytic streptococci, *Streptococcus durans,* Sherman and Wing,[2] may be found in large numbers in samples of properly pasteurized milk. This group is particularly heat resistant and on blood agar plates resembles the human pyogenic type. If these organisms are encountered either during a septic sore throat epidemic or in routine milk control work, a study of their cultural characters should be made before any health significance is placed upon their presence.

It should be the practice of health officers, when an excessive number of septic sore throat cases are reported, to determine whether they can be traced to a raw milk supply. The evidence that raw milk is the source of infection has been generally complete. In most instances, the same type of human pyogenic streptococcus is found in the throat of the milker, in the udder of the incriminated cow, in the bottled raw

TABLE VII

Beta Hemolytic Streptococci Isolated from Septic Sore Throat Epidemic at Waterloo, N. Y.

		Acid Produced from				
Source	*Precipitin Group*	*Sorbitol*	*Trehalose*	*Lactose*	*Final H-ion Concentration Production*	*Attack Sodium Hippurate*
Throat	A	—	+	+	pH 5.0	—
Raw milk	A	—	+	+	pH 5.1	—
Quarter	A	—	+	+	pH 5.2	—
Infected finger	A	—	+	+	pH 5.0	—

supply, as well as in the throat of the infected patient. However, there has been certain criticism of this type of evidence inasmuch as the milker has been consuming the infected supply, and it may be that he has been infected as one of the consumers of this milk supply.

In coöperation with the New York State Department of Health. opportunity has been given for a complete study of a septic sore throat epidemic at Waterloo, N. Y., in which it was possible to determine that the milker was infected prior to the outbreak. Human type beta hemolytic streptococci of identical nature were isolated from the infected patients, from the milk (Table VII), from the bottled raw milk, from the infected quarter, and from an infected finger of the milker. This finger had been infected for several weeks prior to the epidemic and it was obvious that the milker was not infected from the cow—the reverse was evident. This is the final evidence which indicates that the human type of streptococcus originates from the milker to infect subsequently the consumer.

The control of a septic sore throat epidemic is not difficult if facilities are available for the proper pasteurization of the milk. None of the human pyogenic streptococci have been found to resist proper pasteurization temperatures. Immediate pasteurization of the raw milk supply removes the source of infection.

In those cases in which facilities for pasteurization are not present it is imperative that the milk supply under suspicion be immediately rejected as human food and a careful study of each quarter of each cow in the herd be made. Fore milk should be secured from each quarter and the presence or absence of the human pyogenic streptococcus be determined. Useful laboratory methods are outlined in Section K of *Standard Methods of Milk Analysis* of this Association. When the offending cow is detected, she should be immediately removed from the herd, and care should be taken that the udders of the remaining cows are not infected with the same type of human pyogenic streptococcus. Efforts should be made to locate the carrier—the milker or milk handler who has infected the cow. When all of these possibilities have been eliminated, the milk may be used again in the normal supply.

It is also highly desirable that a more uniform practice be adopted in the diagnosis of scarlet fever and septic sore throat to facilitate standard practices in the various states and to make available more reliable statistics on these infections. There is need for this Association to take some organized action suggesting the criteria for the diagnosis of these infections, particularly from the standpoint of suggesting more uniform procedures to be used by health officers in dealing with septic sore throat and scarlet fever.

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A Study of Air Pollution in New York City*

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IT has long been recognized that constant supervision of the supply of food and water to maintain high standards of purity is a responsibility of public health authorities. However, the same principle has not, in general, been applied to the maintenance of purity of the air in spite of the fact that our daily consumption of food and water is only 5½ lb. whereas we breathe as much as 25 lb. of air per day. To be sure, it has been shown that the public health may be rapidly undermined by polluted food and water, whereas epidemics traced to polluted air are rare. The public health significance of smoke, dust, gases, pollen, and microörganisms in the air has been studied from time to time with largely negative conclusions. Prevailing medical opinion seems to be that atmospheric dust, bacteria, moulds and yeasts have little or no pathogenic import and that the spread of disease by any of these media is a remote possibility. However, there has been a unanimity of expert opinion that the presence of smoke and fumes in the air will cause a diminution of the amount of ultra-violet light reaching the earth. This fact has been correlated with the treatment of diseases such as tuberculosis, rheumatic fever, and rickets, so that it is now common practice to remove patients from cities and transport them to sunnier areas. The diminution of ultra-violet light combined with the presence of acid gases in the air and of the polluting elements previously noted, may cause a general lowering of the "tone" of large masses of people and lessen their vitality. Herein lies our concept of the principal public health significance of air pollution. This view places smoke and fumes as the most significant factors in air pollution, acid gases next, and the remaining factors last.

If these same elements are evaluated from a strictly non-medical point of view, the same order of importance is arrived at. From an engineering standpoint, smoke means the incomplete combustion of fuel and consequently waste. In large cities it has been estimated as amounting to millions of dollars worth of fuel each year. Smoke, soot, cinders and fly ash are charged with the dirtying of vegetation, streets, buildings, homes, clothing, and humans, causing cleaning bills amounting to enormously high figures. If to this be added the destruction of vegetation, structures, and personal property by the corrosive effects of the acid gaseous constituents,

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it can readily be seen why prevention of air pollution was for many years known to the public as "Smoke Abatement." The exhaust fumes of internal combustion engines introduce gases, both malodorous and otherwise, capable of producing nausea, headache, and, in extreme concentrations, death. The fume and odor emission from non-fuel burning sources is also frequently of a noxious and offensive character.

Considering the principal source of air pollution to be the combustion of fuel, it was logical that, when in September, 1935, the Works Progress Administration organized the Air Pollution Survey of New York City, under the sponsorship of the Department of Health, the first studies were those of fuel consumption and smoke production.

Through the coöperation of the Port of New York Authority, the U. S. Army Engineers, and the traffic divisions of the railroads having terminals in New Jersey, a complete record of all fuel movement into New York City during the year 1934 was obtained. These data were analyzed as to fuel type, month of movement, and both borough and public utility distribution.

The annual consumption of solid fuel is 20,000,000 tons, of which 53 per cent is anthracite. The annual consumption of fuel oil is 600,000,000 gallons. This means that approximately 5 per cent of all the coal consumed in the United States is burned within the area of 309 square miles that constitute New York City; that 20 per cent of the nation's anthracite is consumed to make New York the largest anthracite consuming area in the country. These data are shown graphically in Figures I and II. Figure I indicates that the bulk of the soft coal is burned in the furnaces of public utilities. There is an increase of anthracite consumption during the winter months (Table I) but a uniform bituminous coal consumption throughout the year. This analysis shows that, during a typical year, there were discharged into the atmosphere of New York City, exclusive of the discharge

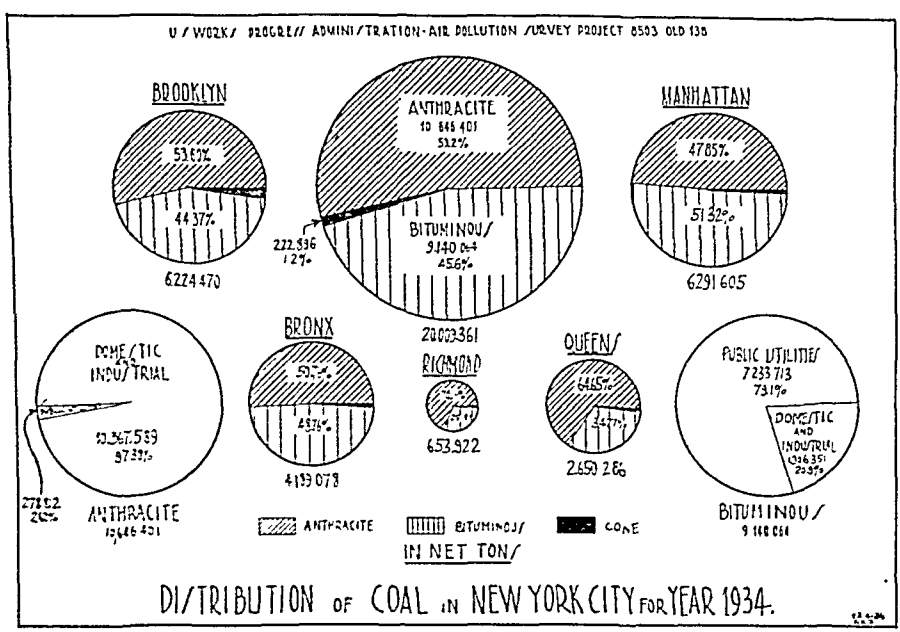


FIGURE I

TABLE I

Monthly Movement of Coal Into New York City for Year 1934—Net Tons

Month	*Anthracite*	*Bituminous*	*Coke*	*Total*
January	1,305,976	848,540	22,028	2,176,544
February	1,274,244	808,896	38,939	2,122,079
March	1,244,619	866,899	48,026	2,159,544
April	714,477	741,260	7,732	1,463,469
May	735,635	716,581	6,351	1,458,567
June	640,462	708,280	6,730	1,355,472
July	672,186	688,245	3,321	1,363,752
August	587,579	706,728	6,664	1,300,971
September	693,336	709,868	13,451	1,416,655
October	777,883	759,538	23,470	1,560,891
November	703,912	778,733	20,484	1,503,129
December	1,296,092	806,496	25,700	2,128,288
Total	10,646,401	9,140,064	222,896	20,009,361

from internal combustion engines, 300,000 tons of soot, tar, cinders, and fly ash, and 350,000 tons of sulphur in an oxidized form which probably forms about 1,000,000 tons of sulphuric acid. The largest consumption of both total solid fuel and bituminous coal occurs in the borough of Manhattan where 31 per cent of the total fuel is consumed. In this borough 35 per cent of the bituminous fuel is consumed, and for it much more detailed survey information was obtained concerning fuel distribution and use than for any of the other 4 boroughs. Simultaneously with the study of fuel movement into New York, the Air Pollution Survey conducted a house-to-house survey of Manhattan. The data obtained were summarized into block, census tract, health area, and

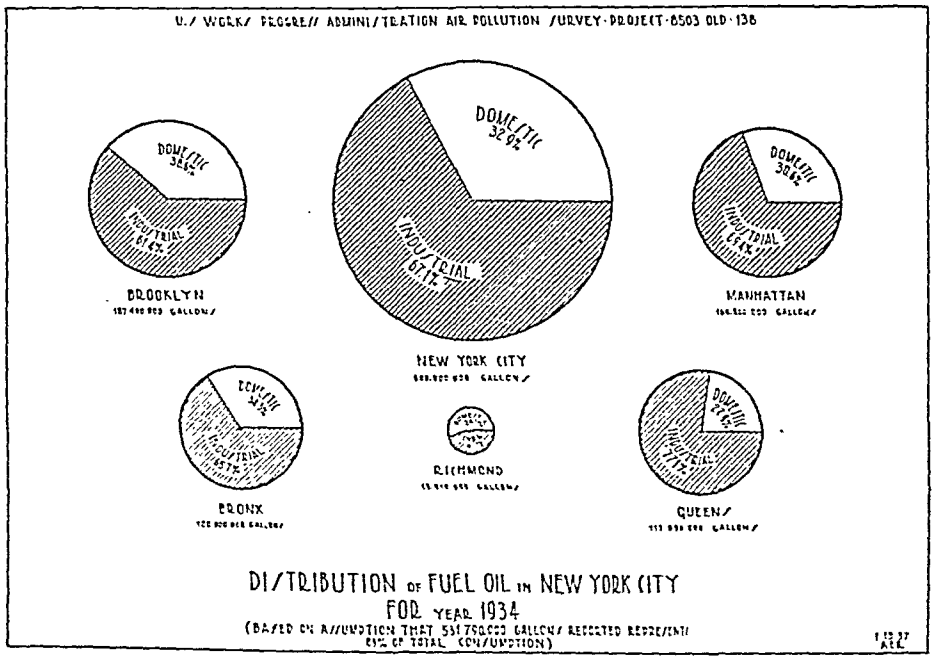


FIGURE II

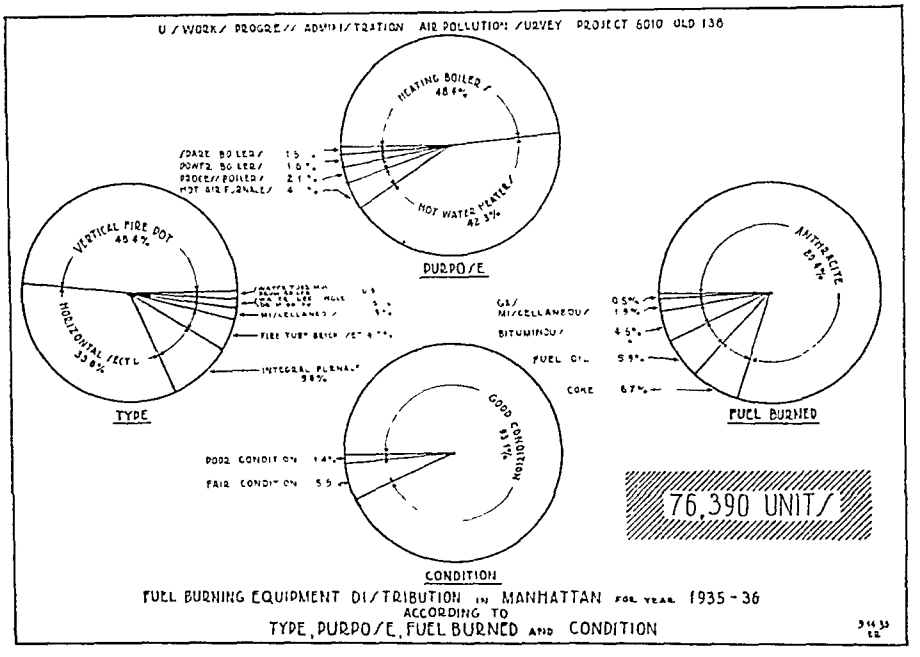


FIGURE III

health center district totals for each of the items surveyed. Access was obtained to over 95 per cent of the 72,784 Manhattan premises and it was ascertained that 66 per cent of these had installations of fuel burning equipment, hence, were potential producers of smoke. In these premises were found 76,390 units of fuel burning equipment. The consumption of fuel oil in the borough, obtained by summarizing the data from 3,238 oil burning premises is 141 million gallons, which checks quite well with the 146 million gallons obtained from the study of fuel movements. Similarly the 7,120,000 tons of coal obtained from the fuel burning equipment survey checks closely with the 6,290,000 tons from the fuel movement study.

The summarized results given in Figure III show the types of equipment installed in Manhattan for the burning of fuel. In order to secure data on potential sources of smoke among vessels in the harbor, one of the most active in the world, records were obtained of the fuel consumption of each of 1,200 steamships. The largest single class of steamships operating is tow boats. A summary based on 488 of the 548 such craft known to be operating, indicates that 64 per cent of the fuel consumption is bituminous and 16 per cent fuel oil, both capable of producing smoke. However, based on 97 of the 101 ferry boats, 69 per cent of their fuel is smokeless, indicating considerably less of a smoke problem than with tow boats.

In contrast with other large cities locomotive smoke in New York City is a relatively minor problem, as almost all the railroads within the city are electrified or use Diesel engines. The few coal burning locomotives operating, plus such sources as open dump fires, steam rollers, steam shovels, cranes, and tar kettles constitute the remaining possible sources of smoke as yet unsurveyed. These will be surveyed during the coming year, in order to complete the picture of smoke sources in Manhattan. Surveys are now being made of the other boroughs. Data such as these

for the entire city form the ideal background of information upon which an intelligent campaign of smoke elimination can be based.

Maps are prepared showing the geographical distribution of fuels likely to cause smoke and may be used to form the basis for equivalent maps showing the geographical distribution of smoke production. However, a preferable procedure is to prepare these smoke production distribution maps based directly upon measurements of smoke in the various parts of the city. All smoke survey procedures are based upon the familiar Ringleman Chart. Surveys conducted in other cities such as Chicago, Salt Lake City, and St. Louis, have been based upon the average smoke density of a number of individual stacks each read at random for a period of at least 15 minutes This is at best an unsatisfactory method, particularly when applied to a large city. Therefore, for our work, a new method of smoke survey was devised and tried, using a group averaging 20 smoke observers located on 20 of the 64 tall buildings distributed throughout the 5 boroughs as observatories. The smoke survey form and details of the method have had several changes during the year, with a view of obtaining the fullest information about smoke production so that both a geographical and a seasonal variation of smoke production could be obtained from an analysis of the survey data. The size range of stacks are graded according to Table II. The most recent modification of smoke density measurement procedure allows a geographical and seasonal coverage of every section in New York with but 10 observers rather than a coverage of but one-fifth of the city with the original requirement of 20 observers. It will thus soon be possible to map smoke production for New York City, just as potential sources of smoke production have been mapped. Maps of this nature are also of value to show progress in the elimination of smoke.

Coupled with the burning of fuel and the production of smoke is the production of cinders, fly ash, soot, and tarry particles emitted from these chimneys. This material will eventually settle out of the air on to the earth's surface. The larger particles will settle directly due to their own weight; the smaller will

TABLE II

Classification of Stacks
Smoke Survey

Class	*Type of Stack*	*Diameter in Feet*	*Flue Gas Emission cu. ft. per Minute*
A	1–2 Family Dwellings Tenements 1–2 Story Commercial Buildings Rooming Houses	0–1	0–1,000
B	Apartment Houses 6–7 Story Office Buildings Small Factories—Garages—Theatres 6–7 Story Hotels—Schools—Churches Public or Semi-public Buildings	1–3	1,000–10,000
C	Large Commercial—Industrial Buildings Large Hotels—Lofts—Warehouses Breweries—Laundries—Bakeries—Hospitals Processing Plants—Incinerators	3–9	10,000–100,000
D	Public Utility Power Plants	9–up	over 100,000

float for a considerable distance but will eventually either settle out due to their own weight, be washed out by rain or snow, or flocculate to form larger particles that will then settle or be washed out of the air. It is thus obvious that prevailing wind direction and velocity will have a very large effect in determining when and where these particles will settle but that the principal factor in the distribution of particle settlement will be when and where these particles are produced. It is thus possible to ascertain the general direction of the sources of particulate matter by determining where it settles and what sort of wind carried it to the point of settlement. In addition to the value of tracing pollution to its source, it is of interest to know the actual distribution of settled matter in so far as it visibly represents the dirtiness caused by air pollution. This settled matter, the so-called "soot-fall," is the cinder that gets in one's eye, the dirt that settles on the roof and the street and on the floor in one's home. It includes the tarry matter that dirties windows, building walls, vegetation, and clothing, and the soluble particulate matter dissolved and precipitated by the rain. There obviously must be a close relationship of the quantity and character of this sort of emission to the smoke that originally accompanied a large part of it, and the fuel from which it was produced.

Soot-fall is collected in copper cans 5 inches in diameter and 8 inches deep exposed for a month on flat roofs of one and two story buildings, and is reported in terms of tons of settled matter per square mile per month. In this Air Pollution Survey an average of 130 such cans were exposed in all 5 boroughs each month. Their contents were analyzed in the Chemical Laboratory for 2 fractions, insoluble and sol-

TABLE III

Typical Soot-fall Data for the Month of April, 1936—Tons per Square Mile per Month

		Insoluble Matter				*Soluble Matter*						
Type Area	*Station*	*Solids*	*Ash*	*Carbon*	*Tar*	*Solids*	*NH*	*Cl as NaCl*	*SO_4*	*Ash*	*Total Solids*	*Total Ash*
Industrial												
21 King St	130	139 06	76 69	62 37	1 37	18 68	0 37	2 27	7 49	15 87	157 74	92 56
80 Van Alst Ave	312	171 55	137 80	36 75		17 83	0 63	2 16	12 49	10 46	192 38	148 26
Commercial												
1 W 125th St	112	59 86	42 23	17 63	4 69	10 35	0 41	1 48	4 09	7 06	70 21	49 29
33rd St & 8th Ave	104	91 36	55 92	35 44	0 48	20 97	0 37	2 64	6.78	6 37	112 33	62 29
Slum												
Rivington & Chrystie	131	103 24	59 82	43 32	2 25	9 16	0 35	0 94	11 14	6 12	122 40	66 00
38 Catherine St	133	226 96	91 63	135 33	3 18	16 97	0 52	1 40	14 56	10 38	243 83	102 01
Harbor												
Aquarium	103	51 49	30 82	20 67	0 24	9 94	0 26	0 63	4 62	4 33	61 43	35 15
131 Water St	135	198 75	93 09	105 65	0 17	17 00	0 44	3 14	6 82	9 98	215 75	103 07
River												
692 11th Ave	118	24 43	16 42	8 01	0 48	9 53	0 22	1 48	1 16	4 75	33 96	21 17
Franklin & Dupont	411	96 13	69 30	26 83	0 15	16 43	0 61	2 11	4 13	8 41	112 56	77 71
Residential (Multiple)												
1414 Inwood Ave	204	33 05	20 03	13 02		11 45	0 26	1 13	3 90	2 72	44 50	22 45
156th & St Nicholas	109	42 12	30 10	12 02	0 65	9 20	0 41	1 77	4 05	5 95	51 32	36 05
Residential (Private)												
212th & Hillside	322	10 25	7 50	2 75		1 96		0 15	1 66	1 06	12 21	9 46
1215 E 15th St	109	38 06	31 34	6 72	0 22		0 28	0 87	3 17			
Suburban (Control)												
Beth Page	705	3 90	1 72	2 18		13 18		1 11	1 83	0 57	17 08	2 29
Westbury	703	7 63	5 34	2 29		27 92	0 17	1 90	4 75		35 55	

uble. The insoluble fraction is further divided into insoluble solid matter, ash, combustible matter, and tar (carbon disulphide soluble matter). The soluble fraction is broken down into soluble solids, SO_3, NH_3, Cl (as NaCl), and ash. Control stations were used in Westchester and Long Island. These cans collect, as well, settled matter of non-fuel burning origin, such as plant matter, salt from sea spray, and inorganic atmospheric dusts from numerous sources. However, the percentages of soluble matter, combustible matter, tar, SO_3, NH_3 and Cl serve as good indicators of the source of the greater part of the settled matter in each gauge. Typical data from this survey are reported in Table III. As can be seen from this chart, the slum areas are the worst, with the harbor, industrial, and commercial areas next in order. Residential sections are low; private residential sections are of the same order as the suburban areas, and are lower than multiple dwelling areas.

Each of the components for each month are also drawn up on a 5 borough map to show the geographic distribution. Figure IV shows the distribution of total solids for the month of April, 1936. It should be noted, that regardless of wind direction a map of this sort shows which health district has the heaviest deposit and this is primarily what the survey is interested in, as it visibly represents the dirtiness caused by air pollution.

Because SO_2 emitted from the stacks of fuel burning plants diffuses rapidly and is mixed into the atmosphere by wind and convection, it is not possible to trace this gas to its source with the same facility as particulate matter.

Because of the very small quantities of SO_2 in the air, it is necessary to absorb this polluting element from a relatively large volume of air in order that the absorbent contain a sufficient concentration for accurate laboratory analysis. By the method used, which is to pass 1 cubic foot of air per minute for 60 minutes through the Greenburg-Smith type impinger tubes, which are used as absorbing bottles, the concentration of SO_2 in the absorbent is still so low as to require very sensitive methods of determination. Most of these depend upon the oxidation of SO_2 to SO_3 and the corresponding reduction of an iodine compound, which releases free iodine as a colorimetric indicator.

The particular technic used in this survey consisted in absorbing in a 10 per cent NaOH solution, adding HCl and CCl_4, and titrating with KIO_3 until a pink color due to iodine appears and then disappears in the CCl_4 layer. It will be noted that this method does not measure SO_2, but rather measures total active reducing gases present in the air. This fact was checked by measurements of total sulphate gravimetrically and it was thus shown that other reducing agents than SO_2 were active in New York City air. In an attempt to explain this finding, a number of special studies were made. It was found that in clean glassware, SO_2 (absorbed in NaOH solutions) does not change much on standing; that there is no appreciable oxidation of SO_2 to SO_3 on passing air through the solution for an hour; that higher gas concentrations are absorbed with more efficiency than lower concentrations; and that the colorimetric phenomenon representing the end point of the titration differs in appearance between equivalent concentration of pure SO_2 and of reducing substances in city air. An interesting speculation, on which research is now being undertaken, is that some of these other reducing substances are from automobile exhaust gases.

Regardless of the exact nature of the polluting gases measured by this technic, a part is SO_2 and measurements by

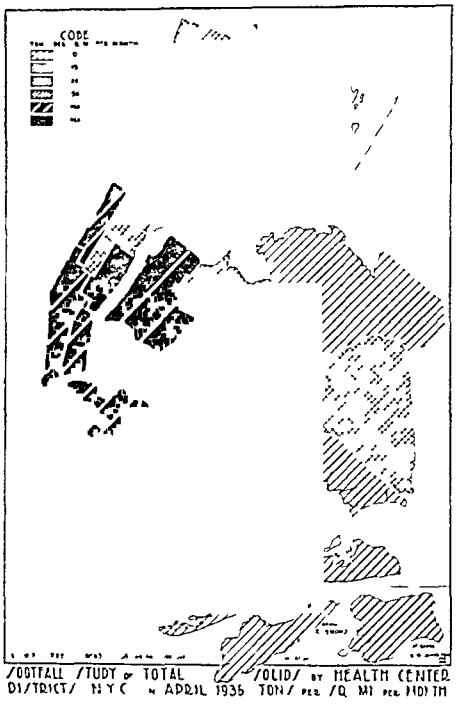


FIGURE IV

this method give an index to the potential corrosive acidity of the air. In other words, this method does give a measurement of the extent that the air is polluted by the gases that damage vegetation, structures, and fabrics.

Just as SO_2 and the associated gases in the air have been measured by absorption in NaOH solutions in the Greenburg-Smith Impinger, so have NH_3 and other alkaline gases been absorbed in dilute H_2SO_4 and the ammonia measured in a Kjeldahl apparatus. Ammonia is a normal constituent of air, the small quantities usually present coming from the decomposition of organic matter. However, in the several months for which data are available. ammonia in New York City air has consistently been close to normal and therefore consistently below levels likely to cause physiological effects.

The procedure has been to sample simultaneously for SO_2, NH_3, and atmospheric dust using 3 impinger bottles actuated by a common pump. The bottles used for dust collection contain distilled water and are counted microscopically in the laboratory, using Sedgewick Rafter counting cells with Whipple disc and light field according to the standard U. S. Public Health Service technic, although at the present writing correlative studies are being made of the use of darkfield illumination. The range of the impinger dust counts by standard light field procedure has varied between a maximum of 148 million particles per cubic foot near sand-blasting operations on building faces to a minimum of 85,000 particles per cubic foot in the street air of a residential area, with an average of about 200,000 particles per cubic foot of air in the street. Dust counts were also made by the Owens Jet Dust Counter under light field and high power and show an average count in the street air of 16,500,000 particles per cubic foot.

Dust content in schools, theatres, and other places of congregation will be measured this year and correlated with bacteria count. A study of dust content in New York City subways has been made. The results in subways shows that the greatest concentration of dust is found on all lines between 34th Street and 96th Street, Manhattan; also that the concentration of dust in the tunnel was about 3 times as high as that obtained just as soon as the train left the tunnel and emerged into the open air. The concentrations on platforms in the subways were greater than those found in the train at the same station.

The original plans for the gas analysis procedure to be employed for the measurement of atmospheric CO called for the use of the blood-pyrotannic acid method. However, after a careful trial, this method proved unsatisfactory for the particular sampling conditions de-

sired and was abandoned. It was replaced by a commercial CO indicating meter based upon temperature measurement of the heat of the catylitic combustion of CO to CO_2 in a hopcalite bed. This has proved more satisfactory and has allowed the measurement of CO in streets and in automotive vehicles. These latter studies in vehicles have indicated that the headache and nausea occasionally experienced in automotive vehicles frequently occur when the CO concentration is below that capable of producing those symptoms. Since these symptoms almost invariably occur only when odor is present, and since CO is known to be odorless, the conclusion is that the aldehydes, both saturated and unsaturated, cause the symptoms noted. Quantitative measurements of these gases by absorption are now being attempted, but we have as yet been unable to obtain a satisfactory absorbent.

This completes that part of the survey devoted to the measurement of air pollution caused mainly by the combustion of fuels. Two of the remaining parts are quite independent of this source: pollen and bacteriological (including moulds and yeasts), while the final study occupies an intermediate position: ultra-violet light study. This latter is an attempt by means of quartz spectrographs and Geiger-Mueller quantum counters sensitive to the ultra-violet region to determine the amount of the various wave lengths of ultra-violet light reaching the street level in the heart of New York after having traveled through the city's smoke and dust haze. In so far as this diminution of ultra-violet is one of the few definitely proven harmful effects of air pollution upon health, this type of measurement should by itself serve as an index of the extent to which the pollution is remedied by efforts at smoke and dust abatement.

During the pollen season—March to October—we have exposed daily microscope slides, coated with glycerine jelly dyed with basic fuchsin, for a period of 24 hours at each of 9 different locations in the 5 boroughs of New York. These are being counted for the presence of each of the common tree, grass, and weed pollens likely to be found in New York, particularly noting, of course, the ragweeds. Pollen counts of this sort such as shown in Figure V are arbitrary to the extent that they do not propose to determine the number of pollen per unit volume of air, but merely the relative number falling on one slide compared with that falling on a similarly exposed slide at some other location or some other time. These pollen counts were published daily in a New York newspaper during the latter part of ragweed season in the form of a bulletin listing the total number of pollen and the total number of ragweed. A number of physicians have subsequently stated that these were of value to them in determining the daily treatment of their patients.

The bacteriological survey was instituted because of the belief that the subject warranted extensive reinvestigation. A new method of study was made feasible by the perfection in 1933 of a machine, the Wells Air Centrifuge, which, it was believed, would yield reliable data.

While numerous studies of bacteria in air were made during the 19th century, the results were of negligible significance. However, during the first two decades of the present century, a number of workers in public health in the United States (Winslow, Baskerville, Rettger, Weinzirl, Soper, Browne, Ruehle, Whipple and others) using various modifications of the double sand filter originally designed by Petri and, in one instance (Rettger) using an improved water aeroscope, made studies

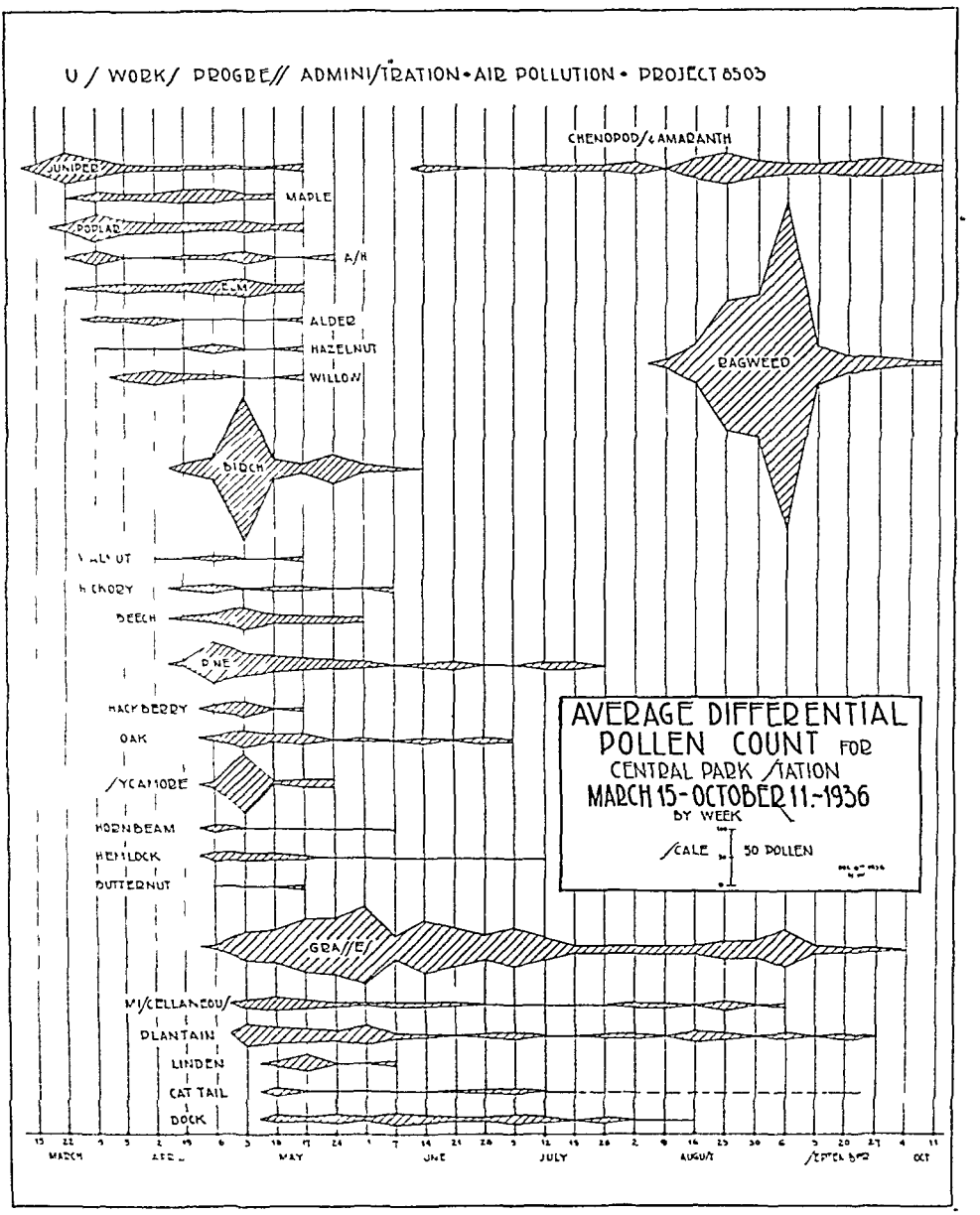


FIGURE V

of air in schools, streets, subways, dairies, and other places. Most of their efforts were concerned with the estimation of the number of bacteria per unit volume of air, and in some instances, the number of streptococci that appeared on litmus lactose plates. The wide variations in results leads one to suspect unavoidable errors in technic. Most of the methods demanded a separate piece of apparatus for each step in the process of isolating bacteria; that is, one apparatus to create air flow, another to measure it, still another to remove bacteria from the air, and a final one to grow them for counting.

No doubt the complications entailed, combined with cumbersomeness of apparatus, hampered routine collection of samples. This may account for the waning interest in air analysis and its lapse into disfavor. The study of air bacteriology was greatly stimulated, if not actually revived, by the development of the Wells Air Centrifuge, in 1933—referred to above. This centrifuge creates an air flow, measures the flow, precipitates the bacteria onto a thin layer of agar, and then permits of their being counted after incubation of these media on the same bottle.

The objectives of this study are to obtain a composite picture of the number and kind of bacteria in the air of places of assembly such as schools, theatres, and subways in which could be delineated the variations induced by population density, season, time of day, and meteorology, and to determine the degree of relationship, if any, of these findings to the public health.

The ease with which samples are obtained by the Wells centrifuge simplifies the planning of routine collection of samples and allows the maintenance of fixed schedules for sampling. For example, 6 public schools have each been sampled twice a week on the same days of the week, in the identical rooms, and at the same hours of the day, for a period of approximately 6 months (until the schools closed for the summer vacation). Similarly, air in subways has been studied at the same hours 5 days a week. The same routine was followed in theatres, both before and during performances, and at the remaining types of locations. As is seen from

TABLE IV

Bacteria per Cubic Foot of Air in New York City at Various Locations
Incubated 18 Hours at 37° C.
(2,734 Samples)
Week Ending Friday, January 10, to Week Ending Friday, June 26, 1936

	Sheep's Blood Beef Infusion Agar		*Beef Infusion Agar*	
Type of Location	*No. of Samples*	*Bacteria per cu. ft. of Air*	*No. of Samples*	*Bacteria per cu. ft. of Air*
Schools	707	29.6	678	21.1
Subway	290	19.2	294	12.4
Theatre—Non-ventilated (Auditorium)	104	13.2	110	8.4
Theatres—Ventilated (Ducts)	149	3.1	114	1.4
Streets	143	11.2	134	8.5
Park	13	3.0	18	1.8

Streptococci per Cubic Foot of Air in New York City at Various Locations
(Sheep's Blood Beef Infusion Agar)
16 Week Period—January 23 to May 15, 1936

Type of Location	*No. of Samples*	*All Streptococci*	*Beta Hemolytic Streptococci*	*Alpha Hemolytic Streptococci*
Schools	353	0.20	0.01	0.18
Subway	225	0.10	0.0003	0.085
Theatres—Non-ventilated (Auditorium)	78	0.04	0.001	0.038
Theatres—Ventilated (Ducts)	116	0.03	0.0005	0.026
Streets	123	0.05	0.0001	0.045

Table IV which presents data on the number of bacteria and the number of streptococci per cubic foot of air collected in several types of locations during the first 6 months of 1936, of 2,754 samples (approximately one-half on blood agar and one-half on plain agar), more than 57 per cent, or 1,585, were taken in schools, 21 per cent in subways, and 22 per cent in theatres, streets, and parks. The number of bacteria grown on blood agar samples exceeds that on plain agar samples in every type of location. There is no explanation for this except the obvious one that blood agar allows full growth of certain delicate organisms which are unable to propagate on plain agar. Each batch of media used for sampling, both plain and blood agar, is tested in the laboratory for its ability to grow streptococci and pneumococci. Plain media, therefore, would be expected to grow these organisms from the air. Another point of interest is the apparent distinct differences in the total counts at the several types of locations. A definitely greater number of bacteria were found in school air than in that of any other type of location. The air of subway cars, while showing fewer bacteria than schools had more than that of theatres, streets, and parks. The auditoriums of theatres (non-ventilated) had more bacteria than streets, the park, and the ventilating ducts of theatres. Streets had more bacteria than the park and the ventilating ducts of theatres. The latter two locations had approximately the same number.

Since these results cover only a part of the samples which it is hoped to have collected when this study is completed, they are being presented solely to indicate the trend of the data. Presumably, the difference between the several types of locations will remain in the same order of magnitude. It may be stated tentatively, therefore, that schools and subway cars have greater concentrations of bacteria per cubic foot of air than do theatres and outdoor locations.

Table IV also gives the estimated number of streptococci per cubic foot of air in the same types of locations for a 16 week period from January 23 to May 15. It is seen that, here again, the schools have more streptococci than do any other type of location, and the subway is again second. The streets, in contrast with the findings for all bacteria per cubic foot, have slightly more streptococci than do the auditoriums of non-ventilated theatres. The ducts of ventilated theatres again have the lowest number. The division of the streptococci into Alpha and Beta streptococci show that the Alpha streptococci are in great preponderance. It is of very great interest that approximately 90 per cent of the Alpha hemolytic streptococci from schools and subway air are organisms whose normal habitat presumably is the human naso-pharynx, as determined by the Holman system of classification of streptococci.

SUMMARY

Little attempt has been made in this paper to present complete or final data, this being reserved for a subsequent report of the survey now in the process of preparation. Some of the highlights and some typical results have been presented. The plan of the most comprehensive study of air pollution ever attempted in New York City has been outlined. These studies lack the air of authority given by years of repetitive results which have served to verify the studies of the Meteorological Office in Great Britain and of certain other American cities. However, they do more than make up for this deficiency by including in the short range program a more intensive geographical coverage

of a municipality, and a wider scope of correlated studies than it has ever been possible to obtain heretofore.

The results obtained from this investigation will be made the basis for an extensive revision of the sanitary regulations relating to smoke and air pollution to provide for such requirements as the approval of plans for new installation or extensive alterations of fuel burning equipment, and for standards for allowable emission of smoke, soot, fly ash, cinders, acid gases, fumes, and other polluting elements. With such detailed data on local conditions available and an adequate code on air pollution, it will be more readily possible to reduce to a minimum air pollution in this metropolitan city, and to be able to measure the results obtained.

ACKNOWLEDGMENT

Without the men and money made available to the Health Department by the Works Progress Administration, this program which has long been in the minds of officials interested in the abatement of air pollution, would have still remained a hope rather than the present actuality employing over 150 men to provide the basic data upon which future abatement programs may be planned. Acknowledgment must be made of the valuable aid of Dr. John Oberwager, Director of the Sanitary Bureau, New York City Department of Health, in planning and directing this survey, and of Dr. Leon Buchbinder, Director of the Bacteriological Laboratory and of Jacob Siegel, Director of the Chemical Laboratory of the Air Pollution Survey, in developing methods, supervising the work, and preparing and compiling the data of this study.

Popular Interest in Science

. . . Nevertheless, he [Voltaire] did science one good turn: he impressed the general public with her importance. This is all that a literary man can do for science, and perhaps only a literary man can do it. The expert scientist is too conscious of the difficulties of his subject; he knows that he can only communicate his discoveries to us by simplifying and therefore falsifying them, and that even when he can state a fact correctly we receive it incorrectly, because we cannot relate it to the thousands of other facts relevant. The literary man has no such misgivings. His imagination is touched by the infinite variety of the natural world; he reads books about it, skipping the statistics, he forgets most of what he does read, and perhaps he performs a few experiments in order to grasp the meaning of research. Then, in the course of his other activities, he writes about science, with a spurious lucidity that makes the expert smile. Spurious, but stimulating; the public does realize, from the remarks of such men as Lucretius, Voltaire, Charles Kingsley, Samuel Butler, Aldous Huxley, Gerald Heard, that something is happening It does get a misty idea of the expanding empire of mankind. . . . The literary man loves images, and as soon as he has found a vivid one, his interest in the truth it is supposed to illustrate is apt to cease. But the scientist knows that Nature is Nature.

Voltaire himself was literary, yet he had enough sense of science to perceive his own limitations, and . . . if "popular interest in science" has any importance (for my part, I think it has immense importance), he must be honoured as an early popularizer." — E. M. Forster, *Abinger Harvest*, 1936, p. 213.

Relation of Bovine Mastitis to Human Disease*

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BOVINE mastitis occurs throughout the United States and, probably, wherever cattle are bred and milked. In our northern states it is very common. Few herds are at all times free from it and in occasional badly infected herds the proportion of infected animals has been as high as 80 or 90 per cent. In the South, where cattle are out of doors much of the time, it is said to be less prevalent.

ORGANISMS INVOLVED

In a large majority of cases the infections are streptococci which have been loosely classified under the synonymous names of *Streptococcus agalactiae* or *Streptococcus mastitidis*, which differ in certain biological properties from the strains commonly associated with human infections. However, on occasions which are relatively rare, considering the high incidence of bovine mastitis, udders become infected with hemolytic streptococci of human origin. Except for laboratory identification of the causative organisms, there apparently is nothing to distinguish these cases from those incited by the organisms commonly responsible for mastitis. Staphylococci have been held by various observers to be responsible for from 10 to 30 per cent of mastitis studied and colon bacilli are said to be responsible for some cases.

In tuberculosis and infectious abortion (Bang's disease) in cattle, infection may be localized in the udder. Rosenau [1] estimates that from 1 to 2 per cent of tuberculous cows have udder infections but, considering the likelihood of many such lesions being overlooked in routine examinations, it seems probable that this is a very conservative estimate. We have been unable to find any definite data on the proportionate number of udder localizations among cows infected with abortion but Mitchell, of the Animal Disease Research Institute, Hull, Canada, in a letter, says he believes they occur frequently. An examination at Detroit, in 1931,[2] of 136 blood reactors (in dilutions of 1 to 100) revealed, it was reported, that 73 did not give positive milk agglutinations. From this it is inferred that the remaining 63 did give such reactions. Gilman [3] has expressed the opinion that when a positive milk agglutination in a dilution of 1 to 80 is observed, udder infection should be suspected. On this basis udder infection may have been present in 46 per cent of these reacting animals. The unofficial and independ-

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ent " guess " of a man who has worked extensively with abortion in cattle is only a little below this figure.

RELATION TO HUMAN DISEASE

The danger arising from tuberculous infection of the udder is too well known to necessitate discussion. It is safe to assume that it has been responsible for a large part of our human tuberculosis of bovine origin. The eradication of bovine tuberculosis is gradually eliminating this source of human infection.

In New York State for the past 2 years the average number of undulant fever cases reported per year has been 265, most of them apparently milk-borne. Considering the very general prevalence of abortion in cattle this is, relatively, a very small number. Just why the number is so small there and elsewhere never has been satisfactorily explained, and we believe that the possibility that milk-borne infection occurs largely as a result of udder foci has not yet been sufficiently explored.

It has been quite generally considered that the streptococci falling in the agalactiae or mastitidis group, commonly present in mastitis, are not pathogenic for man. It certainly is true that large numbers of persons have consumed them in raw milk without harm being discovered and cultures have been administered to laboratory animals, including young dogs,[4, 5] without ill effect. On the other hand, Swithinbank and Newman, in 1903,[5] expressed the opinion that they were " not infrequently the cause of serious gastrointestinal disorders in infants." Toxic substances in milk from cows suffering from chronic streptococcic mastitis have been held responsible for several outbreaks of gastroenteritis in New York State, including 3 involving from 82 to 127 persons each, mostly school children. In these latter instances the streptococci found in large numbers in the milk were reported to be similar to those commonly associated with mastitis. That toxin, rather than bacterial infection, was responsible for the trouble was evident from the fact that attacks occurred in from 2 to 5 hours after consumption of the milk. Since individual cases of gastroenteritis are not required to be reported, it is quite probable that many smaller outbreaks of this sort are never discovered and recorded.

There also is some ground for belief that streptococci commonly associated with mastitis may be responsible for certain low grade infections in man. Saunders, Hulsinger and Cooper,[6] in 1934, reported isolating from 30 resected ulcers of the stomach and duodenum a streptococcus " identical with 3 others isolated from cows' milk and not identical with any other streptococcus examined." Recently Torrey and Montu [7] compared representative strains of Saunders' streptococcus with strains associated with mastitis. While they did not consider them identical, they said: " These and other findings suggest a bovine origin for certain enterococcus-like organisms capable of invading human tissues." In fact, Hare [8] reports the isolation from the blood of 2 fatal cases of uterine infection following childbirth of " strains which resemble those isolated from bovine mastitis in every way." Consideration also should be given to effect on the character of streptococcus infections of possible changes, under just the right conditions, in the virulence, selectivity and conceivably even the type of strains of the common bovine organisms, as well as in tissue susceptibility of the human host.

We now come to a class of udder infections the importance of which, from a public health standpoint, can scarcely be questioned, *i.e.* those responsible for milk-borne outbreaks of septic sore throat and scarlet fever. In

New York State, exclusive of New York City, we have had 19 of septic sore throat and 4 of scarlet fever in the 8 year period ending with 1935. Twelve of the 19 outbreaks of septic sore throat and 1 of the 4 scarlet fever were traced quite definitely to cases of mastitis. We believe that cases of mastitis are involved in most of the extensive epidemics of septic sore throat and probably also of scarlet fever, and we have been finding the responsible cows with increasing frequency since this part of our investigations has been in the hands of a man who knows cows and farmers, as well as the elementary principles of epidemiology. Often there have been histories of udder or teat injuries immediately preceding the mastitis and in one or two instances teat dilators have been used. One dairyman with a streptococcus throat admitted using his own saliva as a lubricant. Several of our outbreaks have been traced to exceptionally good dairies, the milk of one having had an average bacterial count of 4,000. The cow responsible for one was said to be the most valuable in the herd. The organism found in the human cases has been a hemolytic streptococcus and it usually has been possible to find in the cow an organism having similar morphological, cultural, and biochemical characteristics. In connection with the question of possible changes in strains of various organisms and in host susceptibility it is interesting to note that cases of erysipelas and cases diagnosed as scarlet fever occur not uncommonly in connection with epidemics of septic sore throat.

Our observation supports the belief of others that the organisms responsible for cases of mastitis associated with such outbreaks are always of human origin, *i.e.*, persons, usually milkers, with infected throats or occasionally wounds, even though it has not always been possible to find the individual. In our laboratory the organisms clearly responsible for epidemics usually have not shown the characteristics of the so-called "*Streptococcus epidemicus*."

One of us,[9] has commented on the apparent relative freedom of many states, including some in the South, from milk-borne epidemics of septic sore throat, as compared with Massachusetts and New York, which "contribute" about a third of all recorded in the United States. We pointed to the high recorded death rate from this disease in certain of these states and the fluctuating rate in one as suggesting that outbreaks were being overlooked. Since then the reported relatively low incidence of mastitis in the South has been offered as an explanation. However, we know of no evidence that previous existence of mastitis predisposes to these accidental infections with human organisms or that general freedom from mastitis offers any protection against them. We know that they occur in valuable animals, presumably retained because of the normality and productivity of their udders, and Davis and Capps [10] have demonstrated that udders can be infected artificially with human organisms without difficulty.

Thus far we have referred to staphylococci only to mention their association with a certain proportion of mastitis cases. We know of no differentiation having been made between those associated with bovine and human infections, and little seems to be known about their source in either case. Barber [11] reported a series of gastroenteritis cases which occurred in the Philippines over a 3 year period around 1910, and were attributed to *Staphylococcus albus* toxin in milk from a cow thought to be normal. Other outbreaks of food poisoning from staphylococcus toxin have since been reported. Crabtree and Litterer, in 1934,[12] reported an interesting and enlightening study of an outbreak

involving 97 persons in a school in Tennessee, traced to *Staphylococcus aureus* "enterotoxin" in milk from 2 cows found to have chronic mastitis. Groups of cases occurred at intervals and some patients had repeated attacks. Both albus and aureus varieties were found, the aureus greatly predominating. Albus filtrates were fed to volunteers without ill effect but aureus filtrates, in much smaller doses, produced illness in 12 of 15 volunteers. Samples of milk taken from the cows at intervals gave bacterial counts varying from 2,900 to 17,500. The authors inferred that the discharge of pus-pockets, from time to time, accounted for the occasional higher counts and for the recurrence of cases at intervals.

Gwatkin and others [13] tested 80 strains of staphylococci from milk for toxin production. Toxin was produced by 67.4 per cent of those from cows with mastitis, as compared with 20 per cent of strains from apparently normal cows. Dolman [14] fed filtrates containing staphylococcus toxin to 42 volunteers without ill effect, but a filtrate from one strain obtained from Jordan produced severe gastroenteritis in 3 of 9 volunteers. They concluded that only an occasional strain will produce what they call a "metabolite" capable of causing severe gastroenteritis in man and that the incidence of staphylococcus food poisoning, therefore, is not likely to be high. Our experience confirms these findings.

SUMMARY AND CONCLUSIONS

The most common incitants of bovine mastitis are streptococci of the agalactiae or mastitidis group, less frequently staphylococci, and occasionally colon bacilli. Tuberculosis and Brucella infections also localize in the udder, the latter possibly in a third or more of infected animals.

The streptococci usually associated with mastitis are commonly regarded as harmless for man. However, their toxins, in milk from cows with mastitis, apparently have been responsible for outbreaks of gastroenteritis. Some believe that these organisms, present in milk in large numbers, cause severe gastroenteritis in infants. Similar organisms have been isolated from low grade infections in man and from fatal cases of uterine infection.

Cases of mastitis are occasionally responsible for serious outbreaks of septic sore throat and scarlet fever. They are incited by hemolytic streptococci probably of human origin. The authors know of no evidence that relative general freedom from mastitis, as reported in the South, offers any protection against accidental infection with human organisms.

Staphylococcus toxins or "metabolites" in milk from cows with mastitis, have been responsible for outbreaks of gastroenteritis. Crabtree and Litterer reported a study of such an outbreak. They found both albus and aureus varieties, the latter greatly predominating. Filtrates of the aureus produced illness in several volunteers. Gwatkin and others observed that a larger proportion of strains from cases of mastitis produced toxin than of strains from apparently normal cows. Filtrates of only one of the strains studied caused illness in volunteers.

The general control of mastitis, if feasible, probably should be considered primarily an economic problem of the dairy industry. However, occasional cases of mastitis are responsible for serious epidemics of disease. There is nothing in the physical condition in such a case to differentiate it from the ordinary types of mastitis, and careful laboratory studies ordinarily are made only in the presence of an epidemic. There is evidence suggesting that organisms commonly present in mastitis

may invade human tissues. Pasteurization destroys all of these organisms and probably their toxins as well, but when milk is being sold without pasteurization all cases of mastitis should be regarded as potentially dangerous and milk from any cow suffering from the disease carefully excluded.

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DISCUSSION

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DR. BROOKS has stated that the incidence of bovine mastitis reaches as high as 80 and even 90 per cent in some communities. In Canada, Rosell found that chronic streptococcic mastitis was found to affect 20 to 50 per cent of high milk producers. This disease, therefore, causes a greater loss to the dairymen than any other. Rosell also found that chronic streptococcic mastitis actually constituted 98 per cent of all the cases in high producing cows. At the Provincial Laboratories, Ontario Department of Health, during the past year, when testing the milk samples from 360 cows in 8 producing herds, the incidence of mastitis was found to vary from 5 to 90 per cent.

ORGANISMS INVOLVED

The vast majority of cases of bovine mastitis are caused by streptococci. There are 2 distinct sources of bovine mastitis infection due to streptococci: (1) the great majority of cases are caused by the *Streptococcus agalactiae* (Kitt), frequently called *Streptococcus mastitidis;* (2) the infection caused by a streptococcus of human origin, sometimes called *Streptococcus epidemicus* (Davis). Udder infections with streptococci of human origin occur at rare intervals. The symptomatology presented in the bovine species is similar in both these infections. Laboratory examination is essential to determine the nature of the incitant organisms.

BACTERIOLOGY

The most important cultural characteristics of *Streptococcus agalactiae* are ordinary flocculent aspect, with clear supernatant fluid in glucose broth, its non-beta hemolytic properties, and its ability to hydrolyze sodium hippurate, a final H-ion concentration of below pH 5.0. Streptococci of human origin show beta hemolytic colonies, fail to hydrolyze sodium hippurate and have a final H-ion concentration above pH 5.0.

The bovine udder may serve as a reservoir of infection for both tuberculosis and contagious abortion (Bang's disease). In the examination of 37 milk samples from cattle whose blood gave a positive reaction for Bang's infection, *Brucella abortus* was isolated in 8, or 22 per cent. Gwatkin reported *Brucella abortus* in 43 per cent of the milk samples examined. While it is true that the udder of animals infected with Bang's disease serves as a reservoir for *Brucella abortus* infection, and that a goodly portion of these excrete the organism in the milk, *Brucella abortus* does not frequently cause gross lesions, but may serve as a predisposing factor in the development of streptococcal or staphylococcal lesions. In Ontario, from 1929 to 1936, 758 cases of clinical undulant fever infection in man have been recognized. All of these have been in raw milk drinkers. While the majority of these had contact with infected animals, among them 1 clergyman, 2 physicians, 1 dietician, and several residents, suffered from this infection and yet had no contact whatsoever with animals. Any animal whose blood reacts to *Brucella abortus* antigens should be regarded as a potential source of infection.

Chronic bovine mastitis presents itself in two ways: (1) the acute, and (2) the sub-acute, or sub-clinical type, as it is often called. The acute form probably is not a public health problem, as the course is acute and the mortality is very high. Hucker has stated that probably 8 in every 1,000 cows fall prey to this infection. As probably 90 per cent of all bovine mastitis is caused by the *Streptococcus agalactiae*, and members of this group are generally considered non-pathogenic for man, we may ask what part bovine mastitis caused by this organism plays in a public health program. Gwatkin tested 80 strains of staphylococci isolated from cows' udders. Toxin was produced by 67.4 per cent of those from cows with mastitis, as compared with 20 per cent of strains from apparently healthy udders. Hence, staphylococci, especially *Staphylococcus aureus*, isolated from cows' udders must be regarded with suspicion. Lastly, bovine mastitis must not only be considered from a milk supply, but also from a meat hygiene viewpoint. Fifty-eight animals suffering with streptococcal mastitis of varying degrees of severity were removed for slaughter. The flesh of 19 of these was rejected, as the carcasses showed evidence of pyemia. In a second group, 11 were removed, and the flesh of 1 was rejected because of pyemia. The udder secretion in this case was pus.

DIAGNOSIS

The functional diagnosis of mastitis is made by abnormality of the milk or udder secretion. Mastitis presents a very grave economic problem to the dairyman. Infected animals have a decreased milk supply, reduced butterfat, and the bacteriological quality of the milk is unsatisfactory, as evidenced by unpleasant odor, flavor, increased bacterial count, and increased leucocytic content. The relation of bovine mastitis to public health is that the milk is unsuited for human consumption. Milk substances elaborated by the cells are decreased in the diseased udder, *e.g.*, potassium, calcium, phosphorus, while those due to inflammatory reactions are increased—chlorides, leucocytes, catalases, etc. Such milk is not only less palatable, but the nutritive properties are greatly diminished.

The public health significance of udder infections with streptococci of human origin cannot be questioned. Davis and Capps demonstrated that within 24 hours after artificially infecting the teat, the milk contained human

beta hemolytic streptococci. In Ontario, we have had such outbreaks in raw milk dairies, the first in 1930, involving 457 cases, resulting in 6 deaths, and the second, in 1931, involving 16 persons. In each, a beta hemolytic streptococcus was isolated from a cow's udder.

Effective pasteurization is our safeguard against these infections While pasteurization kills living organisms, public health attention should be given the quality and nutritive value of a milk supply. The leucocytic count may vary widely. Breed found the average cell count 868,000 per c.c. in the milk from 122 cows. Copeland found an average count of 651,000 per c.c. Hucker found 90 per cent of normal udders free from scar tissue showed less than 60,000 cells per c.c.

The diagnosis of bovine mastitis requires: (a) careful clinical examination by a competent clinician, with the aid of field tests such as chlorine, bromthymol blue, rapid catalase, and strip cups, (b) laboratory tests, such as the cultural test and leucocytic count, may be carried out on doubtful cases.

Educational programs relative to proper stable hygiene, the milking procedure, and avoiding the undue urging of dairy cattle to produce, will reduce these infections. An efficient veterinarian, with the aid of the laboratory, can be of great assistance in eliminating and controlling this vast economic and public health problem.

Epidemiology of Leprosy

FOR over a decade the writer has advocated a plan for rapidly reducing leprosy by discovering and treating effectively a large majority of cases in the earliest stages. This plan was based on the facts: (a) that most infections (probably about 80 per cent) are contracted by living in the same house with an infective leper; (b) that the earliest symptoms appear in most cases (probably some 80 per cent), especially in the case of children, within 5 years of exposure to infection; and (c) that by prolonged modern treatment in the early stages the great majority can be prevented from going on to an infective stage. The proportion of cases that can be prevented from advancing is 90 per cent, according to Moiser, who also found examination of the households of all known lepers far more effective in discovering early cases than are surveys of the whole population, invaluable as the latter have proved in India and the Sudan.—Sir Leonard Rogers, M.D., The Epidemiology of Leprosy, *International J. Leprosy*, 4, 4:482 (Oct.–Dec.), 1936.

Methods for Making and Significance of Cream and Butter Sediment Tests*

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THE development and use of a satisfactory method for determining the extraneous matter in butter, by the U. S. Food and Drug Administration, has for the past several years focused the attention of food officials and members of the butter industry on the important subject of sediment. The butter industry has realized that, through the development of a suitable sediment test for cream and for butter, and its general application to cream grading and butter manufacture, effective improvements could be made in the quality of the finished product, and extraneous matter readily eliminated. In some states, inspectors are at present examining cream for its sediment content and have forbidden the purchase or sale of cream that contains excessive dirt and other extraneous matter.

The various methods for determining sediment in cream and butter have been studied, and it has been the hope of the Committee on Standard Methods for the Examination of Dairy Products, that enough data could be assembled to justify the adoption of one or more methods as tentative before the publication of the next edition of Standard Methods for the Examination of Milk. It would appear from the data on hand that further study of the application of the suggested methods is essential.

The development of satisfactory sediment tests for such varied products as sweet and sour cream and butter is not a simple problem. A dilution of the sample of sweet cream with hot water to melt the fat and in part disperse the curd is usually sufficient to permit satisfactory filtration, but with sour cream, and occasionally with butter made from sour cream, it is necessary to add various chemicals as the sample is diluted with hot water to obtain a satisfactory dispersion of the curd and permit rapid filtration.

METHODS FOR DETERMINING SEDIMENT IN CREAM

Size of Sample—At present a 2 oz. sample of cream seems the most advisable. Work done at Purdue University indicates that a 2 oz. sample is just as effective in measuring the amount of sediment as is a 4 oz. sample. If effective, the smaller sample should be used because of the waste involved in discarding numerous samples of material as valuable as cream.

Size of Filter Area—A 1¼" filter disk with an effective filtering diameter of 1" is the size that is generally used with a 2 oz. sample.

While either a lintine disk or nainsook cloth may be used, the lintine disk

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is preferable because of its customary use in the milk industry. If a nainsook cloth disk is used, the mesh should be 120 x 120 per in. In general, filtration is more rapid through nainsook cloth and the amount of sediment that is retained on the cloth is slightly less than that on a lintine disk, but usually the difference is not sufficient to make a difference in classification.

Preparation of Sample for Filtration—Various chemicals have been suggested for use in aiding the filtration of sour cream. These are added to the cream to disperse the curd and to make the material more fluid. The chemicals suggested are[1, 5] borax, lye, ammonia, bicarbonate of soda, and dilute hydrochloric acid.

The procedures are as follows:

1. Hot Water Method—Place the 2 oz. sample of cream in a glass beaker. Add 150 ml. of 83° C. filtered water to the sample and stir the mixture thoroughly. Assemble the tester placing the filter disk in its proper position. The mixture of cream and hot water is then run through the assembled tester as promptly as possible. Rinse the tester with at least 120 ml. of 83° C water so as to wash any sediment adhering to the inside surface of the tester down on the disk. This procedure also removes any foam that may remain on the disk.

The disk should be removed from the tester and placed on a paper towel or similar absorbent material with the soiled or sediment side up. This will absorb the excess moisture, after which the moist disk, if desired, may be mounted on a card for examination.

2. Acid Method—Place the 2 oz. sample of cream in a glass beaker. Add 150 ml. of 83° C. hydrochloric acid solution of 0.03 normal strength (3.2 ml. concentrated HCl in 1 l. of filtered water). Stir the mixture of acid and cream thoroughly and proceed as prescribed in the hot water method.

3. Ammonia Method—Place the 2 oz. sample of cream in a glass beaker. Add 2–4 ml. of ammonia water (28 per cent ammonium hydroxide). Stir the mixture of ammonia water and cream thoroughly and then add 150 ml. of 83° C. filtered water, continuing the stirring during the addition of the water. Proceed as prescribed in the hot water method.

4. Soda Method—Place the 2 oz. sample of cream in a glass beaker. Add 2.0 gm. (½ teaspoonful) of bicarbonate of soda. Stir the mixture of soda and cream thoroughly and then add 150 ml. of 83° C. filtered water, continuing the stirring during the addition of the water. Proceed as prescribed in the hot water method.

The American Association of Creamery Butter Manufacturers through its Research Committee[2] organized an extensive study during the past year to determine the value of the different procedures used to prepare the sample of cream for filtering. Commercial dairy laboratories and several university laboratories coöperated. These laboratories were located in the following 16 states: New York, Ohio, Indiana, Illinois, Iowa, Nebraska, Missouri, Kansas, Michigan, Minnesota, North Dakota, Kentucky, Tennessee, Texas, Oregon, and California. In general, it was requested that each reporting laboratory check at least 3 random-selected samples of cream at periodic intervals. It was requested that each laboratory use those methods which have been advocated by various authorities, *i.e.*, (1) bicarbonate of soda, (2) dilute lye, (3) dilute ammonia, (4) dilute hydrochloric acid. All of the tests were made from a 2 oz. sample of cream, using a standard lintine milk disk and standard milk sediment testers.

In reporting results, the laboratories were asked to state whether the filtration was satisfactory, slow, or unsatisfactory. The results secured are given in Table I.

TABLE I

Per Cent of Satisfactory Filtrations of Cream

Using:	
Dilute hydrochloric acid	97.0
Dilute ammonia	87.0
Dilute sodium bicarbonate	86.0
Dilute lye	61.0

The grade of cream influenced the

ease of filtration less when the acid method was used than when the other 2 methods were used. Results did not agree in different parts of the cream producing area when the soda method was used for cream filtration. The ammonia method worked fairly well on all grades of cream in commercial laboratories, but the college laboratories did not secure as good results. The speed of filtration was not influenced by the season of the year when the acid method was used.

The author in his work at Purdue University has found ammonia preferable to bicarbonate of soda as a means of aiding filtration, and that dilute hydrochloric acid is preferable to ammonia, thus confirming the results secured in the survey.

SIGNIFICANCE OF SEDIMENT IN CREAM FOR BUTTER MAKING

Cream for butter making is secured by using a separator or by gravity separation. In either case it would normally be expected that such sediment as found its way into the milk would be removed in part. However, sediment testing of cream has shown that some cream sold to creameries contains appreciable quantities of sediment. The sediment in cream, like the sediment in milk, indicates carelessness on the part of the producer—evidence which cannot be questioned. This lack of care is not only reflected in the amount of sediment but may also be reflected in the grade of cream. In areas where sediment testing of cream has been practised a noticeable improvement in quality of cream has resulted.

SEDIMENT STANDARDS

Cream sediment disk standards have been prepared in a manner similar to the sediment disk standards for milk.[3] The standards suggested by the Purdue University Dairy Department are: class 1, cream containing no visible sediment deposit; class 2, cream containing a sediment deposit equivalent to the sediment deposit of 0.25 mg. of a soil and cow dung mixture; and class 3, cream containing a sediment deposit equivalent to 0.5 mg. of a soil and cow dung mixture.

These standards are identical with sediment standards used by many boards of health for milk and, as in milk, when objectionable material such as hair, insects or insect parts, or animal matter, is found upon the sediment disk, no attempt should be made to grade these as sediment, but they should be reported separately.

METHODS OF DETERMINING SEDIMENT IN BUTTER

Inasmuch as some samples of butter were found to be even more difficult to filter than cream, the Research Committee of the American Association of Creamery Butter Manufacturers included 1,773 samples of butter in their survey carried out in the laboratories mentioned above. A summary of the results obtained is shown in Table II.

TABLE II

Per Cent of Successful Filtrations of Butter on 1,773 Samples

Using:	
Dilute HCl or Hot Water	93.0
Sodium Bicarbonate	89.0
Borax	77.0

These results are in harmony with those secured at Purdue University, dilute hydrochloric acid being the method now used for all samples sent for sediment analysis.

The procedure for determining sediment in butter is as follows:

Using Lintine Disks—Weigh into a 400 ml. beaker 100 gm. ± 0.1 gm. of the butter to be examined. Add 200 ml. of 0.03 to 0.05 N hydrochloric acid. Heat the mixture over a water bath to 74° C., stirring thoroughly

to insure complete mixing. Run through a milk sediment tester. Rinse out the tester with at least 120 ml of 83° C filtered water. Mount and examine the soiled lintine disk.

Using Filter Papers (Horrall [1])—Weigh into a 400 ml beaker 100 gm. ± 0.1 gm. of the butter to be examined. Add 150 ml. of 0.03 normal hydrochloric acid (3.2 ml. of 35–37 per cent hydrochloric acid diluted to 1 l with distilled water) and place this mixture in an 83° C. water bath. Heat until butter is melted Stir the mixture but once and let it stand until the milk fat rises. Place the filter paper (Max Dreverhoff No. 86, or equivalent) in a 7 cm Büchner funnel containing a 50 mesh copper screen (diameter of which is slightly less than the series of holes in the funnel), seal the paper by suction and warm the funnel with distilled water at 83° C. After sealing, pour the prepared samples of butter very slowly on to the paper, permitting the fat to pour on to the filter paper first. If the filter clogs, pour distilled water at about 83° C. slowly on the paper until it filters freely; repeat this if necessary until the sample is filtered, then wash the beaker, funnel, and paper free from fat using hot distilled water With a pair of tweezers place the filter paper in a Petri dish, or similar container, to prevent contamination

CLASSIFICATION OF SEDIMENT FROM BUTTER

Procedures and standards have not as yet been definitely established for classifying sediment secured from butter. The industry and investigators in this field are attempting to develop adequate standards that will result in the continued improvement of creamery butter.

The Research Committee of the American Association of Creamery Butter Manufacturers has conducted a survey as to the value of the lintine disk for use in grading and classifying the sediment obtained in the filtering of butter. The data from this survey were presented [2] at the June, 1936 meeting of the American Dairy Science Association and the following conclusions reached:

1. The milk sediment testing equipment can be used with satisfactory results

2. The Connecticut Official Milk Sediment Standards of 1931 can be used for interpreting the results.

The Connecticut Milk Sediment Standards of classification of 1931 are now being used by the majority of butter manufacturers in their laboratory control work where lintine disks are used.

In laboratories where filter papers are used, the sediment contained upon the filter paper is first measured by visual inspection; that is, if the paper appears practically clean, the sample is classed as clean; a sample which deposits a small amount of sediment is classed as fairly clean; while if appreciable amounts of sediment are found, the sample is classed as dirty. Then the paper containing the sediment is examined for animal and insect material with the aid of a wide-field microscope. As in milk, if objectionable material is found it is reported independently. The magnifications used are about 25 X and 80 X.

The sediment that may be found in butter consists mostly of burned curd, rust, and material which is designated, for want of a more definite classification, as black and brown specks. Much butter is salted, and the brine contained in the butter has a very corrosive action on the metallic parts with which butter comes in contact. The water used in washing the butter is also a potential source of rust. This is a probable explanation of the presence of rust specks. Systematic studies of the sources of sediment in butter have not been made as yet, but the examinations thus far made have resulted in a marked improvement in the sediment content of butter as found upon the market.

The examination of over 1,500 samples of commercial butter at Purdue University between August 1, 1934, and July 31, 1936, has shown a definite trend toward improvement in the sedi-

ment content. This can only be accounted for by an improvement in the sediment content of the cream from which the butter was made, and the regular examination of the butter for sediment has developed a sediment consciousness on the part of the manufacturer. The improvement that has taken place is shown by a comparison obtained from monthly examinations of butter manufactured in some 60 creameries. Of the samples examined during August, 1934, none could be designated as clean. A year later, August, 1935, 14.7 per cent, and in August, 1936, 56.1 per cent were designated as clean.

RELATION OF THE SEDIMENT CONTENT OF BUTTER TO ITS MICROBIOLOGICAL CONTENT

The yeast and mold count of butter serves as a measure of plant sanitation in the same manner as the bacterial count on milk may be used. Butter with a high yeast and mold count may indicate inefficient pasteurization, and equipment not properly cleansed and sterilized. The evidence secured on the analysis of 1,500 samples of butter over a 3 year period indicates that there is no relation between the amount or kind of sediment in butter and the number of living yeasts and molds contained in the butter.

Informing the manufacturer of the yeast and mold content of the butter he produces, has resulted in a decided improvement. At the beginning, 18 per cent of the samples developed less than 100 yeasts and molds per ml.; after 2 years of work, 65 per cent of the samples coming from the same plants contained less than 100 yeasts and molds per ml.

SUMMARY

From the work accomplished, it appears that sediment tests can be readily made on cream and butter. Hot water and chemicals aid in the filtration of these materials.

The same standards and significance can be attached to the sediment found in cream as to the sediment found in raw milk.

The application of the sediment test to butter has had the effect of reducing the amount of sediment found in cream and butter.

The amount and kind of sediment found in butter bear no evident relation to the nature of the living microorganisms in butter.

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3. *Standard Methods of Milk Analysis.* 6th ed., A.P.H.A., 1934.
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Health Museum

THE former residence of Mrs. Francis F. Prentiss, of Cleveland, has been donated to house a museum of health and hygiene. The building was occupied by the Huron Road Hospital for several years.

The project will be administered by a nonprofit corporation to be known as The Cleveland Museum of Health and Hygiene, Inc. Sufficient funds will have to be raised to maintain the museum.

Improved Laboratory Apparatus

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Diphtheria Culture Outfit

OUR diphtheria outfit expedites the preparation of Loeffler's media and can be recommended as a time and money saver.

The outfit consists of a straight wall vial 75 x 12 mm., with aluminum cork-lined screw cap which permits a tight seal, thus preventing the untimely drying of the media. Tubes are filled by hand and capped with the machine illustrated in Figure I. Three hundred tubes of media are slanted in a copper rack devised for this purpose. Media are coagulated in the autoclave with entrapped air and then sterilized at a temperature of 121° C. for 30 minutes.

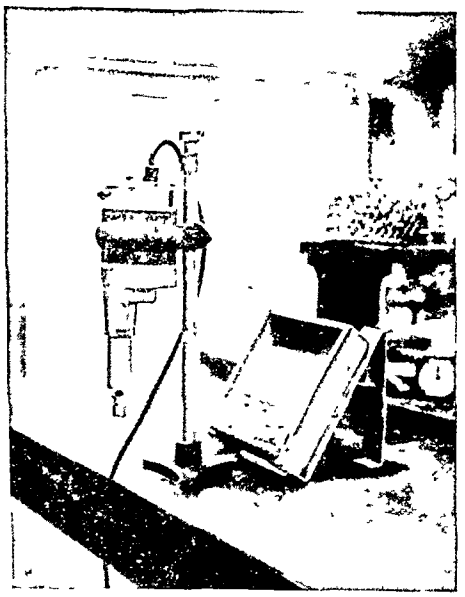


Figure I—Bottle Capping Machine

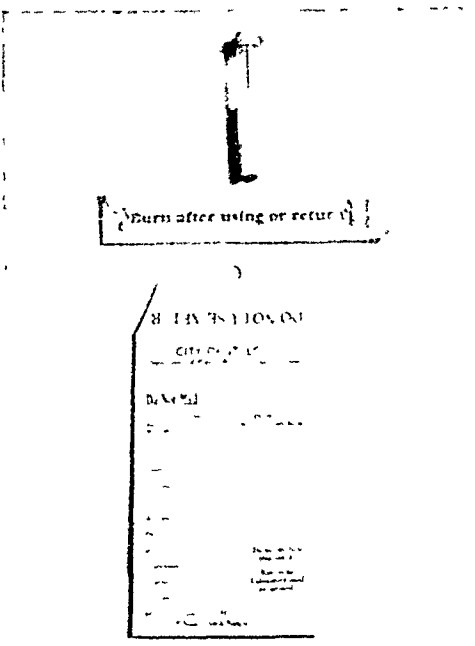


Figure II—Diphtheria Culture Outfit

Figure II shows our double clasp manila envelope which contains the swab envelope and the tube of Loeffler's media. Two swabs are placed in the small envelope and are sterilized in the autoclave, in bundles of about 500, after being wrapped in a thick layer of non-absorbent cotton. This prevents softening of the mucilage and disintegration of the envelope.

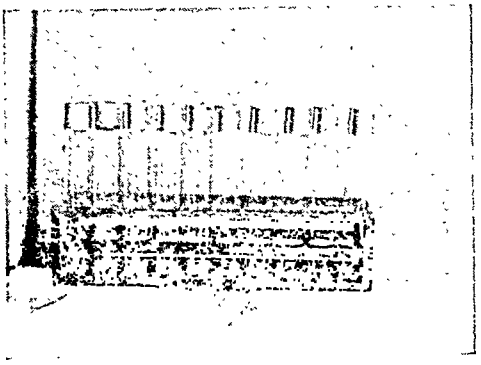


FIGURE III—Aluminum Cap Replacing Cotton Plug

We have also found this vial very satisfactory for dispensing single sugar liquid media and triple sugar agar media. They can be handled in the ordinary Wassermann rack.

A COPPER TUMBLER

The copper tumbler, replacing the glass tumbler, is used for a variety of purposes in the laboratory, but primarily as a container for handling pathogenic bacterial cultures. The tumbler (illustrated on top of 5 gallon bottles in Figure V) is spun from No. 26 gauge copper (U. S. standard plate). It is useless as a drinking cup because of the ¼" holes which are placed ¾" from the upper edge. The container is 3½" high, diameter at top 2½" and at bottom 2¼". Where the original cost is considerably more than the glass tumbler, we have found it more economical, convenient, and safe in the long run. In addition they can be stacked in large numbers in a minimum amount of space.

AN ALUMINUM CAP

These caps are used in place of cotton plugs in connection with the sanitary analysis of water with the tube illustrated in Figure III. Three small indentations are made in the top of the cap so that it will not seat tightly on the tube. The cap is made of 1/16" aluminum and is 1 x ⅛" deep and 1 x ⅛" wide. It has been found that this cap is less expensive than cotton plugs, requires less labor, and is easier of manipulation. We have experienced no difficulty with contamination. Racks are set up with 20 1" x 8" tubes containing 30 c.c. of lactose broth with caps and sterilized in the autoclave, then are used before any noticeable evaporation takes place. Discarded Kahn tubes are used as the inverted tube. Caps of smaller size are used for a variety of purposes in the laboratory.

ACID TANK FOR CLEANING GLASSWARE

The tank as illustrated in Figure IV is made of No. 12 gauge steel lined with ⅛" sheet lead. It is 11" x 19" x 22" and holds 30 liter when filled to the top of the lead baskets. The baskets are of 3/16" sheet lead, 10¼" x 6½", with ¼" perforations. The top of the tank is lead lined and fitted with a handle.



FIGURE IV—Lead Lined Tank, with Lead Baskets

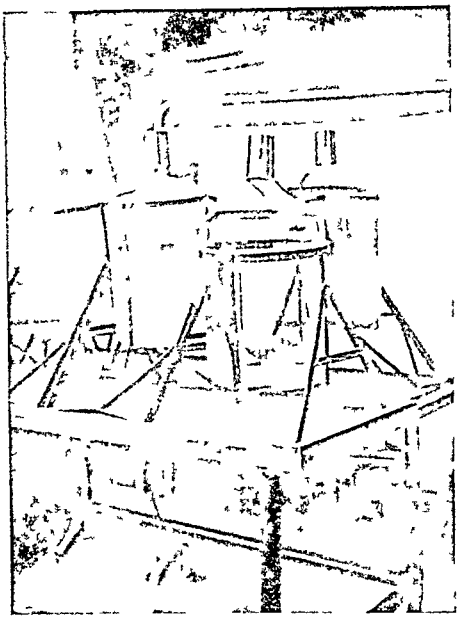


FIGURE V—Five Gallon Bottle Holder

The tank is filled with dichromate sulphuric acid cleaning solution up to the top of the lead baskets. Glassware is permitted to remain in the bath for 24 hr. or less. The baskets with their contents after being drained are transferred to the cleaning sink with a minimum danger to the operator. The glassware breakage is kept to a minimum.

5 GALLON BOTTLE HOLDER

With the use of the metal swinging rack illustrated in Figure V, it becomes a simple matter to handle the 5 gal. bottle. This is a standard commercial rack found frequently in gasoline filling stations and is quite inexpensive. In addition to distilled water we use this outfit for storing Gram's iodine, cresol solution, formalin solution, and other reagents.

Amebic Dysentery and Environmental Hygiene

. . . Perhaps the most practical feature which evolved from the outbreak was the grossly unsatisfactory (on English standards) conditions found as regards the sanitation and plumbing in these two hotels. This is interesting as related to the historical development of public health in U. S. A. and Great Britain. In the latter country public health developed as an extension from a control of the sanitary environment and while this aspect has receded in significance, in essential importance has never been overlooked. In U. S. A. the main developments took place on the floodtide of individual hygiene, so that the environmental side was given a very secondary place and often neglected. Quite inadequate environmental control may be found combined with a development of personal hygiene of the highest excellence. This outbreak is directing attention back in U. S. A. to the equal importance of environmental hygiene.—Review by W. G. Savage, of Epidemic Amebic Dysentery. The Chicago Outbreak of 1933. *Bull. Hyg.*, Jan. 1937, pp. 83–84.

Public Health and Physical Education

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THE relation of physical education to public health is one that is very definite, but seldom given much thought. However, in the present trend toward increased coördination of social agencies we find that physical education and public health do have much to contribute to one another.

Probably the most obvious relationship is that concerned with the degenerative diseases. One of the many contributing causes of the increase in the morbidity and mortality from this group of diseases has been generally pointed out—the sedentary nature of our lives.

Physical education has enlarged its program and made a new emphasis to meet the need for providing exercise of an enjoyable and conservative nature, particularly for after school years. The current interest of physical educators in the sports program, especially in those activities in which one may participate during middle life, is indicative of the recognition of the situation revealed by public health officials. These carry-over sports are being taught more and more on the elementary, secondary, and college levels in order that interest may be developed and sufficient skill acquired to result in the youngsters wanting to engage actively in these activities after school days have passed.

The interest of teachers of physical education in carry-over sports is also evidenced in providing facilities, supervision, and teaching for the wise use of leisure time by adults. Adult education programs, including physical activities, offer an opportunity to reach the present generation of adults without waiting for the next generation to show the results of sports education. Schools are offering their accommodations and equipment for recreational purposes in the evenings—physical educators, together with recreational leaders, plan and teach the fundamentals of sport to thousands of men and women throughout the country. Recreational programs for teachers are becoming increasingly popular; this professional group recognizes the need for regular exercise; physical education teachers heartily support and are leaders in this movement to provide the beneficial effects of exercise for their colleagues. So we see that physical education is contributing to the laudable efforts of public health to decrease the inroads which the degenerative diseases are making in our human resources.

The after-school athletic programs along with the use of schools in the evening for physical exercise, are considered by many as physical education's contribution to the fight against venereal disease which is so current an issue in public health. The outlet which exercise under wholesome conditions provides for the abundance of energy which youth possesses, should be a deterrent to the chance for indulgence in unwholesome sex relations. Youth may be guided into social situations—in this particular case, supervised play—that give little time or opportunity for visiting dance halls, roaming about with the corner gang, etc. It is generally agreed that wholesome, active recreation will definitely alleviate the problem of

venereal diseases, and further the objectives of the social hygiene program. The vast majority of youth will unhesitatingly choose healthful recreation if it is made available to them. Physical education is helping here to solve probably the most urgent problem that confronts public health.

The great incidence of physical defects in the people of the United States is a major consideration of public health. It is likewise an important concern of physical education. The corrective activities which are a definite part of the work of physical education have resulted in early detection of physical defects. In directing children who have serious physical defects to the medical profession, the chance for complete cure and better adaptation of these unfortunate youngsters to life situations is immeasurably improved. Then, too, under the supervision of physicians (especially those trained in orthopedics), physical educators have helped to eliminate orthopedic defects prevalent in the children of America. Where complete elimination of defects has been impossible, the individual health training classes have helped to improve the physical condition of boys and girls displaying physical liabilities.

Many teachers of physical education have among their duties the teaching to their pupils of the elements of personal and community hygiene. School administrators have assigned this responsibility to the physical education instructors mainly for these reasons: their training, usually includes more instruction in health than the academic teacher; secondly, the budgets of most public schools are so meager that the provision of salaries for special teachers of health is impossible; lastly, the modern professional training of teachers of physical education is directed toward the need for health education in the schools. An interesting development in graduate work is the ever increasing number of physical education teachers who are making public health their major in their quest for higher degrees. The administrative duties of directors of health and physical education in the public schools require this fundamental knowledge of public health practices, together with the mastery of the offerings of physical education and education in general.

Perhaps other contributions of physical education to public health (for example, the mental hygiene benefits of an intelligently planned activities program) can be pointed out by the reader. But let these few examples suffice in order that we may turn to the contributions of public health to physical education.

Public health does and should publicize the major problems which endanger the health of our citizens. Perhaps the profession might well indicate specifically how the school, including physical education, may help in the early and effective solution of these problems.

Education in public health provided by experienced workers in this field should be made readily available to physical educators. The writer doubts if many in his profession read the *American Journal of Public Health* or even have access to it. Your knowledge should be disseminated so that physical educators will have an authentic source for health information. Commercial advertising, quackery, fads inevitably warp the health teaching in many schools. It is essential that the knowledge of public health reach physical educators throughout the country.

Public health officials by actively and wholeheartedly coöperating with the teachers of physical education in local situations can readily gain their help in facilitating the adoption of the program in public health education. We, as physical educators, want to help. We only ask for the opportunity.

Vi Antigen in Carrier Strains of Eberthella Typhosa*

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VI ANTIGEN was described by Felix and Pitt [1, 2] in 1934. In their first paper these authors showed that while the O inagglutinable typhoid strains were virulent for mice, O agglutinable strains were only partially so. They showed O inagglutinability was not demonstrable in all strains, and was entirely absent in their strain 901. The O inagglutinability described disappeared under the action of various agents. In their second paper [2] the nature of this labile factor was clarified in that a newly described antigen was shown to be responsible for the O inagglutinability and virulence. This antigen, Vi (virulence), was found by agglutination and adsorption tests to be distinct from both the H and O antigens. The existence of this new antigen was confirmed by Kauffman [3] in 1935 who demonstrated further that the Vi agglutinogen was far more thermolabile than the H, being completely destroyed in 1 hour at 60° C. Vi agglutinogen resists formalin and therefore Vi immune serum can be prepared with either living or formolized bacilli. However, antiserum prepared with living antigens usually results in higher titers. Felix and his collaborators have shown that the Vi antibody is of primary importance in the defense against attack by virulent strains of *Eberthella typhosa*. Bhartnagar [4] in 1935 showed that inagglutinable strains rich in Vi antigen were highly resistant to phagocytosis, while agglutinable strains devoid of Vi antigen were highly susceptible. Later investigations by Felix and Bhartnagar [5] demonstrated that Vi immune serum produced by injections of living virulent strains of *E. typhosa* exerted a powerful phagocytosis-promoting action on strains containing Vi antigen while it was without any effect on strains devoid of this antigen. Furthermore, Vi immune serum excelled the O immune serum in its phagocytosis-promoting function as it did in the protective action against attack by strains of high virulence. These authors emphasized the necessity of using Vi antigen from living organisms for the preparation of therapeutic antityphoid serum of high potency. Felix and Pitt [6] later showed that rough variants derived from strains of *E. typhosa* which possessed the Vi antigen may still contain the Vi antigen even though the smooth O antigen has been entirely lost. This was confirmed by Kauffman.[3] These variants although non-virulent were still capable of producing both active and

* Read before the Laboratory Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936.

passive immunity. Felix and Pitt [6] suggest that the virulence of the typhoid strains depends on the combined activity of the smooth O and Vi antigen although the Vi antibody alone is sufficient to protect against infection with highly virulent strains. They suggest further the possibility of the use of avirulent, rough, but Vi-containing variants in the preparation of vaccine and therapeutic antiserum.

EXPERIMENTAL

On the assumption that Vi antigen determines the virulence of smooth typhoid strains a study was made of 39 such strains isolated from carriers to determine whether it would be possible to group these carriers on the basis of their ability to disseminate the disease. Preliminary work was done on carrier strains which had been maintained in the laboratory stock collection over a period of from 1 to 5 years. Studies were also made on the preparation of Vi antiserum and on the thermostability of the Vi agglutinogen.

Preparation of Vi Antiserum—Antiserum was prepared with 3 strains known to contain Vi antigen.* Each antiserum was prepared by injecting daily into rabbits increasing amounts of light suspensions of living antigens starting with 0.1 ml. and increasing gradually to 1.5 ml. Fresh antigen suspensions were prepared every 3 days. Ten to 11 daily injections were made in this manner and the animals were bled 2–3 days after the last injection. The Vi titers varied from 1:400 to 1:1,280. The time necessary to develop these antisera was in no case greater than 15 days.

The 3 strains containing Vi antigen were tested to determine the presence of H and O antigenic components. In no instance were we able to demonstrate complete O inagglutinability with these 3 strains. Although the Watson and Ty 2 strains showed very little H agglutinogen the O agglutinogen was readily demonstrated by direct agglutination. The lack of inagglutinability was to be expected because the strains had not been kept on special media but carried on standard nutrient agar, pH 7.4. Hence the serum produced with these strains contained both H and O agglutinins and it was necessary to adsorb all the antisera used in the experimental work with strain H901 which removed the H and O agglutinins but left Vi agglutinins intact. The Vi serum titers (1:400 to 1:1,280) were obtained after adsorption with strain H901.

In checking old carrier strains for Vi antigen 2 antisera, Watson and Rawlins, were used. After adsorption with strain H901, each of the carrier strains was tested in the adsorbed serum using (1) unheated antigen, and (2) antigen heated for 1 hour at 70° C. The results obtained are shown in Table I. The results indicate that Vi antigen may be demonstrated in strains at least 5 years old even when these strains have been carried on standard agar. They also demonstrate that heating these strains at 70° C. for 1 hour destroys the agglutinability of the strains in Vi antiserum. It was possible to confirm the results obtained on 5 strains with Watson Vi antiserum sent to us by Dr. Felix and adsorbed with H901 by him (Table I).

It will be noted by referring to Table I that the Bush strain agglutinated in the Rawlins antiserum but failed to agglutinate in the Watson antiserum. The reverse of this was true with the Scha strain. Because the work with the Rawlins antiserum had been done

* Dr. A. Felix of the Lister Institute kindly sent us two of these strains. Ty 2 and Watson. A third strain, Rawlins, was obtained through the courtesy of Dr. Donald T. Fraser of the Connaught Laboratories, Toronto, Ont. For use later as controls, antisera were prepared with strains H901 and O901 also sent to us by Dr. Fraser.

TABLE I

Vi Antigen in Carrier Strains Tested with Pure Vi Antisera

Carrier Strain Antigens	Rawlins Antiserum † Tested With: Antigen Unheated	Rawlins Antiserum † Tested With: Antigen Heated at 70° C. for 1 hr.	Watson Antiserum † Tested With: Antigen Unheated	Watson Antiserum † Tested With: Antigen Heated at 70° C. for 1 hr.
H 901	0		0	
O 901	0		0	
Watson			1:1,280	0
Rawlins	1:640*	0		
Ferg	1:40	0	1:80	0
Gril	1:160	0	1:1,280	0
Ross	1:80	0	1:640	0
Schaef	1:80	0	1:1,280	0
John	1:160	0	1:1,280	0
Smi	1:40	0	1:640	0
Bul	1:80	0	1:640	0
Hog	1:80	0	1:640	0
Red	1:80	0	1:80	0
Bush	1:40	0	0	0
Haub ‡	1:40	0	1:160	0
Pist	1:80	0	1:160	0
Burk	1:320	0	1:1,280	0
Mus	1:80	0	1:320	0
Schae	1:80	0	1:160	0
Mer	1:80	0	1:160	0
Cor	1:80	0	1:640	0
Gram	1:40	0	1:40	0
Gauth	1:40	0	1:320	0
Scha	0	0	1:80	0
Bed	1:40	0	1:320	0
Vin	1:40	0	1:320	0
Kep	1:40	0	1:160	0
Lab	1:320	0	1:640	0
Grim	1:80	0	1:320	0
Cash ‡	1:640	0	1:640	0
Bang	1:20	0	1:160	0
Lit	1:160	0	1:320	0
Cor	1:160	0	1:1,280	0
Rich	1:20	0	1:160	0
Thom	1:80	0	1:160	0
Kirip	1:160	0	1:320	0
Schae	1:320	0	1:1,280	0
Crez	1:80	0	1:320	0
Fer	1:40	0	1:640	0
Koe	1:40	0	1:160	0
Car	1:160	0	1:320	0
Bab	1:80	0	1:80	0
Cas	1:320	0	1:640	0

* Dilution in each instance represents at least ++ agglutination.

† Pure Vi antiserum was obtained by adsorption with H 901.

‡ The Cash and Haub strains were tested with a pure Vi antiserum (Watson) sent to us by Dr. A. Felix. Both these organisms agglutinated in this serum to 1:400 (++++). Three other strains Capp, N.Y.C., and Gall, not included in table, were also checked with this serum with similar results.

several weeks prior to that with the Watson antiserum and since the strains studied had been developed from single colonies it.seemed possible that the variation in Vi content might depend on the colony chosen. Accordingly, 37 of the strains shown in Table I, and 5 carrier strains freshly isolated were studied to determine whether colonies might vary in their Vi content.

Method—Each of the 42 strains studied was inoculated into broth. Within 20 hours these broth cultures were streaked on a single eosin-methylene-blue agar plate. After a 24 hour growth period approximately 9 colonies were transferred from each plate to agar slants at pH 7.4 and incubated 24 hours. Antigens were made by emulsifying the growth in salt solution. Each antigen was divided into two portions and one portion heated for 1 hour at 70° C. Both heated and unheated antigens were tested for Vi agglutinogen in a pure Vi serum. A total of 347 colonies were examined in this manner.

The results obtained indicate a variation in the Vi content of colonies picked from a single strain and that individual colonies may or may not show the presence of Vi antigen. It will be noted that 18.5 per cent of the 347 colonies studied showed no Vi antigen, while 81.5 per cent of the colonies picked from the same plates showed Vi antigen. Although 37 of the strains studied had been carried in stock from 1 to 5 years similar results were obtained with 5 strains recently isolated from carriers. Three of these strains were obtained from Ross L. Laybourn of Topeka, Kans., who informed us that the specimens from which the strains were isolated had been collected in 0.5 per cent lithium chloride.

Vi Antibody Produced by Extracts of E. typhosa *—Two extracts were used to develop Vi antibody. These extracts were prepared by heating heavy suspen-

* We are greatly indebted to Elinor V. Smith, Brown University, Providence, R. I., for her coöperation in these studies.

sions of *E. typhosa* for 4 hours at 60° C. The suspensions were then centrifuged and filtered through Berkfeld N candles. One antiserum, 14, was produced by 3 injections of 1 extract into a rabbit. This rabbit was very ill after the first injection. Antiserum 15 was produced by 1 injection of the second extract. This rabbit developed a chronic debility. Antiserum 24 was produced by 2 small injections of the same extract that had been used to produce antiserum 15. This rabbit showed no reaction. Antiserum 17 was produced by the same extract used to produce antisera 15 and 24, but in this instance the extract was boiled for 1 hour before injection. Three injections were given and the rabbit showed no reaction. Adsorbing these antisera with strain H901 completely removed H and O agglutinins. The adsorbed antisera were then tested for Vi antibody with the Ty 2 and Watson strains (Felix). We were able to demonstrate Vi antibody in antisera 14, 17, and 24, but not in antiserum 15. It will be noted above that antiserum 15 was produced by a single injection of the extract that was used in preparing antisera 17 and 24 both of which showed Vi antibody. The lack of Vi antibody in antiserum 15 might have been due to animal variation, but more likely it was caused by injection of an insufficient quantity of antigen. In view of the apparent thermolability of Vi antigen demonstrated *in vitro* it is interesting to note that an extract heated for 4 hours at 60° C. and then boiled 1 hour before injection was capable of producing Vi antibody *in vivo*.

TABLE II

Variation in Vi Antigen Content of Colonies Picked from Carrier Strains

Carrier	Number of Colonies Studied *	Vi Antigen: Colonies Positive †	Vi Antigen: Colonies Negative
Ferg	10	8	2
Gril	10	6	4
Ross	10	10	0
Schaef	9	9	0
John	9	7	2
Smi	9	8	1
Bul	10	10	0
Hog	6	4	2
Red	10	6	4
Bush	6	5	1
Pist	10	8	2
Burk	10	10	0
Mus	6	3	3
Schae	9	8	1
Mer	10	8	2
Cor	10	7	3
Gram	10	8	2
Gauth	10	10	0
Scha	18	12	6
Bed	9	6	3
Vin	6	6	0
Kep	5	5	0
Lab	9	6	3
Grim	10	7	3
Cash	6	3	3
Bang	6	3	3
Lit	8	8	0
Cord	10	10	0
Rich	10	9	1
Kirip	9	9	0
Scha	10	5	5
Crer	10	8	2
Fer	5	5	0
Koe	10	10	0
Car	8	7	1
Bab	8	6	2
Cas	8	8	0
Perf	7	7	0
An	10	7	3

* Studies were made with pure Vi antiserum, titer 1:640. After adsorption with H-901, control agglutination tests against H-901 and O-901 showed complete adsorption.

† In each instance this antigen could not be demonstrated by agglutination tests after it had been heated to 70° C. for 1 hour.

DISCUSSION

Vi antigen was demonstrated in 44 typhoid carrier strains of which 5 were recent isolations. Because of this it was not found possible to separate these carriers into groups depending upon whether or not the strain they carried contained Vi agglutinogen and so to group these carriers on the basis of their ability to disseminate typhoid fever. Special media appear to be unnecessary for the development and demonstration of Vi agglutinogen, since most of the strains studied had been isolated for from 1 to 5 years, and all strains had been carried on standard agar pH 7.4. The observation that colonies from certain strains failed to

show the presence of Vi antigen while other colonies from the same strain contained this antigen made it desirable to determine whether other strains would exhibit this phenomenon.

In a study of 347 colonies from 39 strains 81.5 per cent of the colonies showed Vi antigen, while 18.5 per cent did not. Fourteen of the strains produced no colonies lacking Vi antigen. However, we feel that such colonies were probably present but an insufficient number were chosen to determine their presence. Twenty-five of the strains studied did show colonies which lacked Vi antigen. These results indicate that even though a single colony from a carrier strain fails to show Vi antigen it does not necessarily follow that the carrier of this strain is not a potential source of typhoid fever. It is apparently a matter of chance whether the colony chosen in the isolation of typhoid strains from stool specimens will show Vi antigen. Conversely, it would appear that if a sufficient number of colonies are chosen, Vi antigen will be present in some, and therefore any typhoid strain may be a potential source of Vi antigen. It would seem to us that this has application in the field of vaccine therapy.

Several authors have noted the thermolability of Vi agglutinogen basing their conclusion on the fact that the heating of a culture containing Vi antigen for 1 hour at 70° C. destroys the ability of the culture to agglutinate in a pure Vi serum. However, most of these authors also noted that, although the Vi agglutinogen cannot be demonstrated *in vitro*, the injection of heated antigens into animals does produce Vi agglutinins. The presence of Vi antibody in a serum produced with an extract of the typhoid organism heated for 4 hours at 60° C. in its preparation and then boiled for 1 hour before injection is further evidence of the unusual reaction of Vi agglutinogen toward heat. The authors are in accord with the conclusions of Felix, *et al. (loc cit)* and those of Horgan,[7] that the *in vitro* and *in viivo* activities of an antigen may differ widely and the discrepancies demonstrated be only apparent.

SUMMARY AND CONCLUSION

1. A short method for the preparation of Vi antiserum is reported.

2. It was found impossible to separate carrier strains of *E. Typhosa* into groups depending on the Vi content of the strains and so to group these carriers on the basis of their ability to disseminate typhoid fever.

3. Of 44 carrier strains examined, some of which had been maintained in stock for from 1 to 5 years, all showed Vi agglutinogen.

4. A study of 347 colonies from 39 carrier strains showed 18.5 per cent of the colonies lacking in Vi agglutinogen.

5. This study suggests that Vi is a normal somatic antigen of the typhoid organism and that under the proper conditions it can be demonstrated in all typhoid strains.

NOTE: The authors wish to express their appreciation to Betty Robinton for technical assistance.

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A Modification of Van Giesen's Stain for Negri Bodies

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THE Williams [1] modification of Van Giesen's stain for the demonstration of Negri bodies in brain tissue has been utilized in this laboratory for several years. This stain gives poor differentiation in certain brain specimens necessitating adjustment of the proportions of the stain for the individual brain tissue. This manipulation of the stain does not always result in a clear-cut differentiation of the Negri bodies. It was found that the pH of the water used as a diluent was a factor influencing the efficiency of the stain.

Buffered solutions were made in accordance with Clark and Lubs' [2] standard mixtures.* A series of waters ranging from pH 6.4 to 8.4 were tested as diluents for Van Giesen's stain. A buffered solution with a pH of 7.4 gave a more uniform staining reaction than any of the other solutions tried.

Seven hundred and seventy-six animal brains were stained with the following formula. Of this number 293 were positive, and all gave a clear-cut differentiation of the Negri bodies.

8 per cent alcoholic solution basic fuchsin	3 drops
Saturated aqueous solution methylene blue	2 drops
Buffered distilled water pH 7.4	30.0 c.c.

The diluted stain is very unstable and should be prepared only as needed. The stock solutions will keep indefinitely.

This stain is used in the usual way. After the impression smears have been fixed with methyl alcohol for 2 minutes and washed with tap water, the stain is added to the slide, heated gently to steaming and allowed to remain for 5 minutes without further application of heat. The smear is then washed with tap water, blotted dry immediately, and examined by the low power objective to locate large pyramidal cells and then by oil immersion objectives. In a large proportion of positive smears the Negri bodies were found with the low power objective and then confirmed with oil immersion.

* Waters with a variation of less than 0.1 pH of the desired was obtainable as tested by potentiometric methods by not adhering to several refinements specified. For instance a phosphate meeting A C S specifications was dried at 110° C and the recrystallization was omitted, regular distilled water was used as a diluent instead of redistilled water

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A Study of the Vi Antigenic Fraction of Typhoid Bacilli Isolated from Carriers and Cases, and the Antibody Content of the Serum of These Patients*

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THE present report concerns an extended investigation of typhoid cultures and sera along the lines laid out in an earlier publication (Almon and Stovall).[1] Since the work was begun, a new reagent in the form of a bacteriophage, for determining the presence of the Vi antigen in typhoid cultures has been described by Craigie and Brandon.[3] They report complete correlation between the sensitivity of cultures to this phage and their agglutinability in Vi antiserum. More than 95 per cent of over 300 typhoid cultures which they tested by this means contained the Vi antigen. Since we have found by preliminary investigation [2] that Craigie's bacteriophage is a very sensitive reagent when employed according to his technic, we have used it, in addition to the methods previously employed, in the study of our cultures.

In this study the Vi content of typhoid cultures was determined by tests for sensitivity to Craigie's bacteriophage; agglutinability in pure Vi antiserum; and, in some instances, virulence for mice. An attempt was then made to determine whether any correlation existed between the characteristics of the organisms thus demonstrated and the clinical manifestations of the individuals from whom they had been derived. For the purpose of these comparisons the cases were classified as "mild to moderate" or "severe," and the carriers were listed in a group by themselves. The bases for classification included such considerations as the height and duration of fever, the length of the illness, the presence of diarrhea or delirium, and the occurrence of any complications, such as hemorrhage, perforation, or phlebitis.

The results of the study of the organisms appear in Table I. The methods employed have been described.[2] The degree of agglutination in Vi serum is recorded in addition to the titer because in efforts to repeat results with certain of the cultures it was found that the degree or type of agglutination remained consistent from time to time, whereas the titer varied considerably. The symbols express the following:

+++ complete agglutination in large clumps

++ complete agglutination in small and large clumps

* Read before the Laboratory Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936.

TABLE I

Analysis of Organisms Isolated from Typhoid Cases and Carriers

	Case No.	Cul. No.	Source of Organism	Titer and Degree of Agglutination in Vi Serum †	Reaction to Phage †	No. of Mice Killed *
Severe Cases	10	T 2	Blood	1,280+++	ACC	2
	11	T 5	Blood	2,560++	PC	6
	12	T 18	Blood	1,280+++	PC	3
	13	T 9	Feces	640++	PC	5
	20	T 22	Feces	2,560++	ACC	..
	21	T 23	Feces	1,280±	ACC	..
		T 24	Feces	2,560+++	CC	..
		T 25	Feces	2,560++	ACC	..
		T 26	Feces	1,280±	ACC	..
		T 56	Feces	1,280+	ACC	8
		T 69	Feces	2,560±	CC	..
	28	T 36	Feces	2,560+	ACC	..
	34	T 42	Feces	640+++	ACC	7
		T 45	Feces	2,560±	PC	..
		T 59	Feces	2,560±	ACC	..
		T 67	Feces	2,560±	ACC	..
	46	T 62	Urine	640+	ACC	..
Mild to Moderate Cases	3	T 4	Blood	1,280+++	ACC	7
	4	T 3	Blood	2,560±	PC	4
	6	T 7	Blood	2,560+++	PC	6
	7	T 10	Blood	640+++	PC	6
	18	T 20	Urine	1,280+	ACC	5
	19	T 21	Urine	2,560++	ACC	..
		T 51	Feces	1,280+	ACC	..
	25	T 31	Feces	1,280±	ACC	..
	26	T 32	Feces	2,560+++	ACC	..
		T 33	Feces	2,560++	ACC	..
		T 34	Feces	2,560+	ACC	..
		T 52	Feces	2,560+	ACC	14
	30	T 38	Feces	2,560+++	CC	..
		T 39	Feces	2,560+++	ACC	..
	40	T 50	Blood	640++	CC	16
	43	T 57	Blood	1,280++	ACC	2
		T 63	Feces	1,280+	ACC	..
	45	T 60	Feces	2,560±	ACC	..
		T 61	Blood	2,560±	CC	..
	47	T 64	Blood	1,280+++	ACC	..
		T 65	Blood	320+++	ACC	..
		T 66	Feces	640+++	CC	..
		T 68	Blood	640+++	CC	..
		T 72	Feces	1,280++	ACC	..
		T 74	Feces	1,280+++	CC	..
		T 77	Feces	640+++	ACC	..

* 20 mice were injected with each culture tested.
† See text for explanation of symbols.

TABLE I (Cont.)

Analysis of Organisms Isolated from Typhoid Cases and Carriers

	Case No.	Cul. No.	Source of Organism	Titer and Degree of Agglutination in Vi Serum †	Reaction to Phage †	No. of Mice Killed *
Cases—No History	24	T 30	Feces	2,560+++	ACC	..
	27	T 35	Feces	2,560+	ACC	..
	29	T 37	Feces	2,560±	ACC	..
	32	T 41	Feces	1,280+	ACC	..
	33	T 44	Feces	1,280++	ACC	2
	48	T 70	Blood	2,560+	CC	..
		T 75	Feces	2,560++	ACC	..
	49	T 73	Feces	2,560±	CC	..
Carriers	14	T 6	Feces	640++	PC	9
	15	T 17	Gall bladder	640+++	PC	4
	16	T 8	Feces	640+++	PC	6
	17	T 19	Urine	2,560++	ACC	1
	22	T 27	Feces	1,280+	PC	..
	23	T 28	Feces	1,280±	PC	..
		T 29	Urine	1,280±	PC	..
	31	T 40	Feces	1,280+	ACC	..
	36	T 46	Feces	640±	ACC	..
	37	T 47	Feces	2,560++	PC	..
	38	T 48	Feces	640+++	ACC	17
	39	T 49	Feces	640+++	ACC	16
	41	T 53	Feces	2,560+++	PC	9
	42	T 43	Feces	1,280+	ACC	4
		T 54	Feces	1,280+	ACC	8
		T 55	Wound	640+++	PC	9
	44	T 58	Feces	1,280±	CC	..
	50	T 76	Feces	2,560++	CC	..

* 20 mice were injected with each culture tested.
† See text for explanation of symbols.

\+ complete agglutination in small clumps
± definite though incomplete agglutination, usually in small clumps

The symbols in the column reporting the reaction to the bacteriophage refer to the appearance of the area on the plate to which the phage had been added; thus CC means completely clear, ACC almost completely clear, and PC partially clear.

One thing emerges clearly from these results: all of the cultures contain the Vi antigen. In our previous work [1] we failed to obtain this result due to the failure to demonstrate agglutinability in Vi antiserum. But the use of Craigie's bacteriophage and a refinement of our methods for producing Vi antiserum (*i.e.*, using it immediately after absorption instead of allowing it to stand a few days) have shown that the only cultures in our collection which do not contain this antigen are some which have been in stock for more than 5 years, and some recently obtained by us from other laboratories where they had been in stock for a long time. Another conclusion which seems warranted by

TABLE II

Antibodies in Blood of Typhoid Patients and Carriers

	Time Since Onset of Illness	Vi Antibody Titer	O Antibody Titer	H Antibody Titer
	7 days	0	2,560	640
	44 days	0	5,120	1,280
	9 days	0	640	320
	18 days	0	5,120	1,280
	40 days	0	2,560	640
	31 days	0	10,240	2,560
	49 days	0	320	80
	7 months	160	1,280	1,280
	6 months	0	640	160
	4 months	160	320	80
	14 days	0	320	320
	8 months	0	640	1,280
	22 days	0	1,280	200
	37 days	0	2,560	640
	59 days	0	2,560	1,280
	4 days	0	2,560	0
	19 days	0	2,560	0
	41 days	0	2,560	160
	6 days	0	2,560	5,120
	21 days	0	5,120	5,120
	45 days	40	640	320
6	8 days	0	1,280	0
	17 days	0	2,560	160
	29 days	0	5,120	320
	1½ years	0	160	160
7	30 days	1,280	2,560	1,280
	42 days	640	2,560	640
8	18 days	0	1,280	320
*18	28 days	0	640	1,280
	42 days	0	640	1,280
	50 days	0	1,280	1,280
	60 days	0	1,280	1,280
19	20 days	160	10,240	5,120
	68 days	40	320	640
25	14 days	160	2,560	2,560
	12 days	160	10,240	10,240
26	4 months	80	160	1,280
30	43 days	0	2,560	1,280

* Developed carrier state.

TABLE II (Cont.)

Analysis of Antibodies in Blood of Typhoid Patients and Carriers

	Case No.	Time Since Onset of Illness	Vi Antibody Titer	O Antibody Titer	H Antibody Titer
	40	14 days	0	80	0
		15 days	0	320	160
		21 days	0	640	320
		27 days	0	640	160
	43	15 days	0	1,280	640
		27 days	0	1,280	1,280
	47	6 days	0	0	0
		20 days	0	320	0
		31 days	0	2,560	640
	51	75 days	160	80	160
Carriers	15	6 years	40	0	2,560
	17	Not known	0	0	1,280
		Not known	0	640	2,560
	22	28 years	0	2,560	5,120
	23	35 years	0	160	320
	31	No history of typhoid	0	80	80
	36	8 years	0	80	160
	37	4 years	0	160	320
	38	20 years	0	80	160
	39	No history of typhoid	0	40	80
	41	33 years	0	160	320
	42	17 years	80	80	640

the results is that the organisms isolated from any given individual show considerable similarity in their behavior toward the bacteriophage; *e.g.*, all of the 6 cultures isolated from case 21 showed complete or almost complete inhibition by the phage (there is scarcely any difference between the complete and the almost complete action); all of the 4 cultures from case 26 showed almost complete inhibition, and so on for cases 30, 43, 45, 47, and 48. The 2 cultures from case 23 showed partial inhibition by phage. Exceptions occur only in cases 34 and 42 in which instance a partially sensitive culture was obtained in a series of almost completely sensitive ones.

In view of the failure to demonstrate any other quantitative correlations we were surprised, not so much by the occurrence of the exceptions as by the infrequency of their occurrence. No other relationships are apparent. The organisms from severe and mild to moderate cases and carriers showed the same variations in behavior throughout. The data on virulence are especially interesting in this connection. As pointed out,[2] the killing of any mice in a test involving 20 mice, each injected with 100 million organisms of a given culture, indicates nothing except that Vi antigen is present in the culture; no quantitative correlations exist. If the ability to kill 14 or more mice be taken as indication of high virulence in cultures, the evidence indicates complete lack of correlation between degree of virulence for man and degree of virulence for mice, for the only cultures in this class were derived in 2 instances

from mild to moderate cases and in 2 from carriers.

The data on the presence or absence of the Vi antibody in human sera are likewise difficult to interpret. These appear in Table II. The Vi titer of the sera was obtained by absorbing them with culture H 901 and testing for the agglutination of either culture Ty 2 or culture Watson. By these means the antibody was demonstrated in 2 of the 10 severe cases, in 6 of the 16 mild to moderate cases, and in 2 of the 11 carriers of long standing. The earliest appearance of the antibody was on the 20th day of illness, Case No. 19, and the titer was declining by the 68th day. It seems that there is no regularity either in the time of appearance of this antibody, or in the event of its appearance at all, though there is corroboration of the suggestion by Felix, Krikorian, and Reitler [4] to the effect that the Vi antibody develops later than the O and H antibodies.

SUMMARY AND CONCLUSIONS

If it is true, as our results and those of others indicate, that all or nearly all typhoid cases are caused by organisms containing the Vi antigen, and if, none the less, the Vi antibody is formed in these individuals only occasionally and at irregular, unpredictable times and bears no relation to the swiftness of recovery or the development of the carrier state, the rôles of this antigenic fraction and its corresponding antibody in the progress of the infection and recovery are very obscure.

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The King's English

UNDER this title A. H. Little presents in parallel columns selected paragraphs from Edward's renunciation of the throne, and the same ideas as some of the rest of us might have said them. Here is a sample:

You all know the reasons which have impelled me to renounce the throne. But I want you to understand that in making up my mind, I did not forget the country or the Empire which, as Prince of Wales and lately as King, I have for 25 years tried to serve.	You are all apprised of the factors that have prompted me to adjure the highest honor within the gift of the British people. But I desire that there shall be impressed upon you the fact that, in arriving at a decision, I was not unmindful, as it were, of the country or the Empire to which, as Prince of Wales and subsequently as King, I have bent my best efforts to give service.

And, says the author (*Printers Ink*, 185 Madison Ave., New York, N. Y., Dec. 17, 1936)—

In a world gone awry with equivocation, God save to civilization such shining exceptions as this English King who, having laid his kingship aside, talked to his people in language that they could not fail to feel and could not fail to understand.

An International System of Health Indices*

A Preliminary Report

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IN recent years there have been many important advances in the development of public health statistics. Improvements have been made in many fields—in the measurement of health conditions in a community; in the appraisal of activities undertaken to conserve the health of a population; and in the study of relationships between environmental factors and health. Nevertheless, the need for a more substantial body of statistical information still exists everywhere. The means to this end must be adapted to the conditions which prevail in different countries.

The Health Organization of the League of Nations has been interested from its inception in the development of public health statistics, and has made some important contributions in this field. Recently, the Organization has attempted to formulate a systematic plan upon which further undertakings might be based. About two years ago, Dr. Ludwig Rajchman, Medical Director of the Health Section of the League, conceived the idea of developing an international system of health indices. After a number of preliminary explorations, a program of study was planned and carried out in Geneva and in the United States as a joint undertaking by the Health Organization of the League and the Milbank Memorial Fund.†

The basic questions of our inquiry may be stated in the following words: What information is needed to evaluate the state of the public health and the factors which affect it? How can this information be arranged in a logical and concise form?

Health indices are neither new nor novel to health authorities. Many such indices have long been in use and, in greater or lesser measure, are routinely collected and published. These may be illustrated by: death rates, crude or specific in respect to sex, age, cause, occupation or place; morbidity rates for

* Read before the Health Officers Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

† The studies in America have been carried on principally at the Department of Public Health, Yale School of Medicine, New Haven, Conn. The authors are greatly indebted to Professor C.-E. A. Winslow, Professor Ira V. Hiscock, Dr. J. H. Watkins, and to others at Yale, and to Dr. J. I. Linde, Commissioner of Health of New Haven. They are also indebted to Dr. W. F. Walker of the Commonwealth Fund and to Dr. George T. Palmer of the New York City Department of Health.

reportable disease; fatality rates; services rendered per reported case or per registered death from a particular disease. The objective of our study is a broader and more systematic arrangement of such data as are available or of such as it is desired should become available for the use of health authorities.

Much of the information which may be required by a system of health indices is not now available in any particular locality. Much which is now available is seriously lacking in international, or frequently even in intra-national, comparability. However, comparability of statistics—like completeness of statistics—has rarely been attained before there was demand for it. A system of health indices may help to create a stimulus for the improvement of public health statistics by including imperfect data and by using them for what they are worth. The recognized imperfections will provide a constant stimulus for the development of comparability through international definitions and standards on subjects which profit from standardization.

A system of health indices must cover a very wide field if it is to furnish precise and objective information on the state of the public health. The system cannot be properly limited to activities for which only the official health department is responsible. On the contrary, it must take account of all important factors which are concerned with the health of the individual, of the group, and of the community. It is a secondary and not a primary issue whether one agency of government or another, whether an official or an unofficial agency, whether a group or an individual, is principally concerned with a particular aspect of the problem or with a specific form of service. The objective is a systematic survey of the health of a people, not the anatomy of existing functional arrangements for health services.

The term *health indices* has been chosen deliberately. It implies a reasoned selection, from the unwieldy mass of public health statistics, of such elements as are most characteristic and descriptive of a given situation.

THE PROPOSED SYSTEM

The proposed system of health indices has 3 main divisions:

A. Vitality and Health
B. Environment
C. Administrative Activity

These 3 main topics have been subdivided to include altogether 44 subtopics. These in turn include about 500 indices with many subdivisions.

Application of the full system of indices to a community requires a detailed study. If the indices are accompanied by an explanatory text, they yield a comprehensive health survey. Thus, the *detailed list* of health indices becomes in effect a survey schedule for the community wishing to make a thorough local study. Its length and detail militate against its use in communities interested in less intensive studies or in brief periodic surveys. The *detailed list* of health indices has therefore been supplemented by an *abridged list* which covers all subjects but includes only about one-fifth of the indices. This *abridged list* is sufficiently subdivided to serve as a survey schedule and yet is brief enough so that its use should not require specially trained personnel or extensive research. Finally, even the *abridged list* has been further condensed into a *short list* of about 75 simple indices which can be compiled without very much labor. This *short list* is sufficient to yield an aeroplane view over the entire field of health interest.

Chart I shows the subjects included in the system of health indices. A few

CHART I

A SUMMARY OF THE SUBJECTS INCLUDED IN THE SYSTEM OF HEALTH INDICES

Subject

A. Indices of Vitality and Health

I. Population
II. Natality
III. Stillbirths, Infant and Maternal Mortality
IV. General Mortality and Causes of Death
V. Morbidity
VI. Invalidity
VII. Insanity and Mental Defects
VIII. Alcoholism and Drug Habit
IX. Accidents
X. Suicides and Homicides
XI. Examinations of Physical Fitness

B. Indices of Environment

I. Climate
II. Topography and Density of Population
III. Occupation
IV. Distribution of Wealth
V. Cultural Level
VI. Illegitimacy and Prostitution
VII. Housing
VIII. Nutrition
IX. Consumption of Alcoholic Beverages, etc.

Subject

C. *Indices of Administrative Activity*

I. Community Expenditures on Sickness and Public Health
II. Sanitary Personnel
III. Vital Statistics
IV. Laboratory Services
V. Acute Communicable Diseases
VI. Venereal Diseases
VII. Tuberculosis
VIII. Other Diseases
IX. General Public Health Nursing
X. Maternity Hygiene
XI. Infant and Preschool Hygiene
XII. School Hygiene
XIII. Physical Education (Outside of Schools)
XIV. General Sanitation
XV. Food Inspection and Nutrition
XVI. Housing
XVII. Industrial Hygiene
XVIII. Health Instruction
XIX. Care of the Insane and Feebleminded
XX. Hospital Facilities
XXI. Health Insurance
XXII. Free Medical Assistance
XXIII. Invalidity Care
XXIV. Care of the Aged

of the less important subjects are omitted (*i.e.*, are not represented by indices) in the *short list*.

It is difficult to show in a short space the actual composition of the detailed health indices. It is expected that complete reports will be published soon.[1] To illustrate the contents of a series of health indices, the tentative *short list* is shown in Chart II.

USE OF THE HEALTH INDICES

In their present form, the health indices are designed for use in local areas. They can be arranged for special application to urban or to rural areas. They may be applied to districts larger than local communities or to part or all of an entire country. The indices have been compiled so that they shall be applicable to widely different parts of the world. Consequently, some of the indices are not pertinent to particular communities. This is not a serious deficiency. The selected lists which we have prepared have no special significance at this time beyond the demonstration that such lists can be prepared. Longer or shorter lists of health indices can be arranged to meet the special needs of one country or another. Particular indices may be added or subtracted. Further study and actual experience should, however, lead to agreement upon a basic list of indices which may be used more or less uniformly in many areas (perhaps in all areas). Such a basic list can be supplemented by other indices appropriate to special needs and circumstances. The indices are simple and their compilation or selection is flexible.

During the course of this study, the system of health indices has been tested by application to the city of New

CHART II

THE SHORT LIST OF HEALTH INDICES

(A Tentative Selection Arranged for a City and Its Suburban Area)

Year:

A. Indices of Vitality and Health

1. Population:
 a. City
 b. Suburban area
2. Annual rate of growth:
 a. City
 b. Suburban area
3. Percentage of children and aged persons:
 a. Under 15
 b. 65 and over
4. Nativity and race:
 a. Native white, native parentage
 b. Native white, foreign or mixed parentage
 c. Foreign born white
 d. Colored
5. Live births per 1,000 women, 15–44
6. Percentage of illegitimate births
7. General death rate
8. Neonatal mortality (under 1 month) per 1,000 live births
9. Later infant mortality (1–12 months) per 1,000 live births
10. Maternal mortality (including abortions) per 1,000 total births
11. Death rate under 1 year from diarrhea per 1,000 live births
12. Death rate from certain causes per 100,000 population:
 a. Tuberculosis (all forms)
 b. Influenza and pneumonia
 c. Cancer
 d. Heart disease
 e. Suicide
13. Notified cases per 100,000 population:
 a. Typhoid and paratyphoid fevers
 b. Diphtheria
 c. Scarlet fever
14. Cases of venereal diseases registered per 10,000 inhabitants
15. Diagnosed tuberculosis cases (all forms) on active file per 10,000 inhabitants
16. New tuberculosis cases (all forms) reported per 100 cases on register
17. Death rate from tuberculosis (all forms) of cases having been on the register for more than 6 months per 1,000 of such cases
18. Percentage of school children examined found to be without physical defect
19. Defects found at school medical examinations per 1,000 children examined:
 a. Heart disease
 b. Malnutrition
 c. Pediculosis
20. Days of sickness of public school children per 1,000 pupil days due to:
 a. Epidemic diseases
 b. Colds
 c. Throat and tonsils
21. Blind persons per 10,000 population
22. Persons killed in automobile accidents per 100,000 population:
 a. City
 b. Remainder of county
23. Persons injured in automobile accidents per 100,000 population:
 a. City
 b. Remainder of county
24. Persons injured in automobile accidents per 1,000 registrations:
 a. City
 b. Remainder of county

B. Indices of Environment

25. Mean monthly temperature:
 a. Highest
 b. Lowest
26. Hours of sunshine in percentage of possible maximum
27. Density of population per square mile:
 a. City
 b. Suburban area
28. Proportion of metropolitan population living in city
29. Percentage of population 15 years and over engaged in gainful occupation:
 a. Males
 b. Females
30. Percentage of families in which wife was gainfully employed
31. Percentage of children of 14 and 15 gainfully employed
32. Percentage of occupied male population engaged in industry
33. Domestic servants per 1,000 population
34. Percentage of illiteracy over 10 years of age:

NOTE: When an index applies to a prior year or to a period of years, specify the period

CHART II (Cont.)

THE SHORT LIST OF HEALTH INDICES

(A Tentative Selection Arranged for a City and Its Suburban Area)

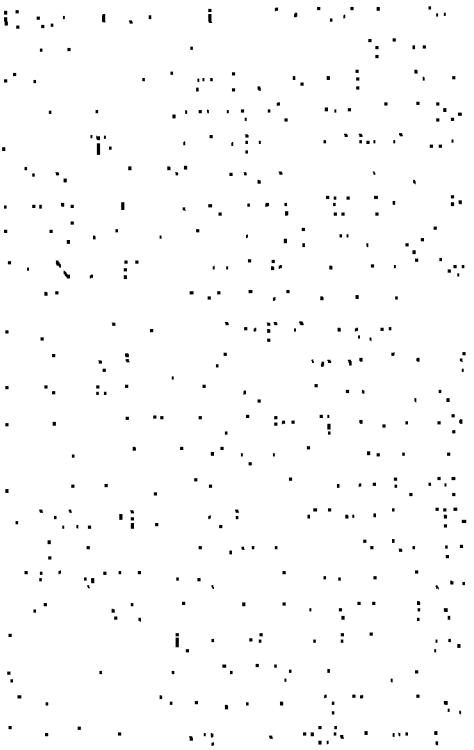
a. Native white
b. Foreign born white
c. Negro

35. Primary school attendance (7–13 years inclusive)
36. Higher school attendance:
a. 14 and 15 years
b. 16 and 17 years
c. 18 to 20 years, inclusive
37. Percentage of homes inhabited by owner
38. Distribution of rented homes according to rent:
a. Under $30 per month
b. $30 to $49 per month
c. $50 and over per month
39. Telephones per 100 inhabitants
40. Automobiles registered per 100 inhabitants
41. Percentage of wage-earners unemployed:
a. Males
b. Females
42. Percentage of families living in one-family houses
43. Number of rooms per apartment in tenement houses
44. Percentage of population which is lodged with less than 1,000 cubic feet of air per person
45. Percentage of homes not provided with bathroom
46. Annual consumption of fluid milk and cream per capita

C. Indices of Public Health Activities

47. Physicians per 10,000 inhabitants
48. Public health nurses per 10,000 inhabitants
49. Health Department budget per capita
50. Other public and voluntary agency expenditure on public health per capita
51. Percentage of deaths from unknown or ill-defined causes
52. Typhoid examinations per case notified
53. Syphilis tests per case notified
54. Milk and cream examinations per 1,000 quarts consumed
55. Bacterial examinations of public water supply per week
56. Number of cases notified per death:
a. Typhoid fever
b. Diphtheria
c. Scarlet fever
57. Cases of measles found by health department personnel per case reported by physicians
58. Visits of nurses and other health department personnel per case of:
a. Scarlet fever
b. Measles
c. Whooping cough
59. Percentage of children who are immunized against diphtheria:
a. Under 5 years
b. 5–14 years
60. Venereal disease cases on register for each new case notified
61. Visits to clinic or physician per registered venereal disease patient
62. Percentage of tuberculosis deaths which were not found on register
63. Tuberculosis clinic visits per death
64. Nursing visits per diagnosed tuberculosis case
65. Contacts on active file in tuberculosis clinics per diagnosed case
66. Patient days in tuberculosis institutions per death
67. Expectant mothers receiving prenatal care per 100 confinements
68. Percentage of maternity cases delivered in hospital
69. Percentage of maternity cases receiving postpartum nursing care
70. Visits to infant clinics per 100 live births
71. Nursing visits to infants per 100 live births
72. Percentage of school children who received a medical examination
73. Percentage of dwellings connected with public water supply
74. Percentage of dwellings connected with street sewers
75. Percentage of milk pasteurized
76. Inspections per dairy
77. Inspections per public eating place
78. General hospital beds per 1,000 inhabitants

NOTE: When an index applies to a prior year or to a period of years, specify the period



The *short list* of about 75 indices could be further condensed without sacrificing any fundamental value in giving an insight into health conditions in an area. (Dr. P. S. Platt showed in 1928 that the administrative activities of 46 cities which had been appraised could be "scored" almost as accurately with 11 appropriately selected criteria or indices as with the 131 then contained in the *Appraisal Form for City Health Work*.[2] A brief list, containing between 30 and 50 indices, might be devised for frequent surveys to measure change or progress in a community. Such a brief list could perhaps be collected and published routinely for many

oy the responsible regional or l health authorities. There be no "scores," and there would ces of end results (*i.e.*, death ickness rates, etc.) as well as of administrative activity. even a very brief list would not emphasis upon "activities" at ense of balance and accomplish- the public health program of unity.

PARISON OF INDICES AND THE APPRAISAL FORMS

ystem of health indices outlined ll not seem novel to American administrators who have had 15 years' experience with the *l Forms* developed by the Com- on Administrative Practice of ociation. There are important of similarity and also of dif- between the system of health nd the *Appraisal Forms*.

Appraisal Forms use a series of ndices (called criteria) to meas- inistrative activities. In this respect our proposal follows the technic of the *Appraisal Forms*. There are, however, differences of two kinds between the system of health indices and the *Appraisal Forms*. The first is in respect to scope and content. The *Appraisal Forms* have been restricted to administrative activities; only meager attention is given to the composition of the survey area and almost none to its social, economic, or cultural environments. Contrariwise, the health indices are intended to cover any subject which has (or is reasonably presumed to have) a significant bearing upon health. The second difference appears in respect to technic. The *Appraisal Forms* use 4 types of data: *criteria* (or indices), *standards, scores,* and *relative values;* the health indices use only one, the *indices* themselves. By omitting standards, scores, and relative values, the

[2] The results of this experimental application of the health indices to the City of New Haven has been published with the complete report on the system of health indices. (See Ref. No. 1.)

health indices gain in flexibility and in breadth of application to counterbalance what they lose in quantitative judgment and definitive appraisal.

So far as the United States is concerned, the system of health indices cannot be viewed as a substitute for the *Appraisal Forms*. The health indices are intended to measure the state of the public health. They are not designed to show precisely which administrative activities are strong or weak. This is a function of the *Appraisal Forms*. If they can be sufficiently perfected, the health indices may serve areas which are not (and cannot be) reached by the technic of the *Appraisal Forms*. This is perhaps particularly true of small towns, rural areas, and communities without organized public health agencies. Yet, if applied to a sufficient number of areas, the health indices can serve for the accumulation of data from which *Appraisal Form* standards can be developed upon many subjects which have hitherto been without quantitative evaluation.

The system of health indices begins by measuring health conditions, health problems, and service needs in a community. The system should therefore encourage local authorities to think in terms of local needs, not in terms of any standard pattern of health work. This point has appealed to the Study Group of the Sub-Committee on the Revision of the Rural Appraisal Form. The Sub-Committee is also concerned with the need to broaden the purview of public health practice. It is therefore now studying the advisability of substituting a scheme of health indices for the miscellaneous items of information hitherto used in the introductory sections of the rural *Appraisal Form*. Thus, we would repeat that health indices would be used not as a substitute for, but as a complement to, the *Appraisal Forms*.

PLAN IS EXPERIMENTAL

The outline of a system of health indices is submitted with full recognition that many difficulties are involved in its use. There is no precedent to follow except in the narrower field of administrative practice. The proposed plan must therefore be regarded as experimental. The arrangement of many items will undoubtedly be found unsatisfactory and will have to be improved, but the experimental stage cannot be hurdled. The concept of the proposed system is brought before the American Public Health Association at this time with the hope that it will be used experimentally—perhaps at the outset in urban areas—and that it will be found worthy of constructive criticism.

What results may be expected from the application of the proposed system of health indices?

1. The scheme of health indices lends itself to systematic survey and exploration of the field of health statistics.

2. The development of an international system may provide a new stimulus to improve the completeness of existing data and to extend national and international comparability in existing and in new health statistics.

3. The *detailed list* of health indices and the schedule forms which have been devised may be used for the purpose of making local and regional surveys. Such undertakings would lead to the preparation of comprehensive reports. These would cover description of the community and its population; the health status of the people; the description and measurement of local health problems; an inventory of the personnel and facilities available for health purposes and health services; and a compendium of health services furnished by official and nonofficial agencies. Publications representing the results of such surveys in a number of communities will have many common characteristics, and the data which are accumulated should have important elements of comparability.

4. The *abridged list* of health indices lends itself to less intensive surveys than can be made with the detailed list. Such surveys can avoid the need for specially trained sur-

[illegible] the [illegible] of the [illegible] indices.

3. The [illegible] of health indices [illegible] in the performance of [illegible]. The discovery of [illegible] in the [illegible] may be [illegible].

4. Even the [illegible] can be [illegible]. [illegible] of health indices. This may [illegible] the [illegible] collection of [illegible] to an understanding of [illegible] conditions, [illegible] and health [illegible] with society or community. Regional and national health authorities may [illegible] to [illegible] such selected health indices for the routine appraisal of local conditions.

The system of health indices is proposed as an instrument which may be applied to serve many purposes in the detailed or in the periodic assessment of health conditions. The system may lend itself especially to the study of change or progress in health needs and activities.

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Cancer Council

A RECENT development of considerable importance in the cancer field was the formation at the suggestion of the National Association of Science Writers of the Cancer Council to act as a clearing house for information and an integrating force in education, therapy, and research.

Members of the Council and the organizations which they represent are: Dr. Frank E. Adair, Memorial Hospital, for the American College of Surgeons; Dr. James B. Murphy, Rockefeller Institute for Medical Research, and Dr. C. C. Little,† Roscoe B. Jackson Memorial Laboratory, for the American Association for Cancer Research; Dr. Karl Kornblum, Graduate Hospital, University of Pennsylvania, for the American Roentgen Ray Society; Dr. Burton T. Simpson,† State Institute for the Study of Malignant Disease, Buffalo, and Dr. James Ewing, Memorial Hospital, for the American Society for the Control of Cancer.

The first meeting of the Council on March 5 was followed by a dinner at which questions submitted by the National Association of Science Writers, a group of newspaper men writing on scientific subjects for daily papers, were discussed and answered. The questions dealt with steps being taken by the medical profession to educate its own members, with research, with diagnosis, the value of X-rays in discovery of the disease, and the possible importance of diet as a cause of cancer. Most significant was the discovery that the newspaper men and the public through them did not realize that the financial resources for cancer research were painfully inadequate. The Council declared, also, that cancer was the greatest public health problem of the day and that "All public health departments should be actively interested in advancing cancer education and encouraging the extension of cancer diagnostic facilities under proper medical auspices."

† Member A.P.H.A.

Reaction of Young Adults to Alum-Precipitated Diphtheria Toxoid*

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OWING to the low risk of attack and the relative mildness of diphtheria in young adults, there is considerable difference of opinion as to the advisability of artificial immunization in this age group. The question is of considerable practical importance as it applies to schools, colleges, and institutions. Obviously a dogmatic answer cannot be given on the basis of present information. Many considerations must enter into the judgment, but perhaps the most important are the local risk of exposure to natural infection, the degree of group susceptibility as measured by the Schick reaction, and the method of immunization which is used, with particular reference to its simplicity of application, its effectiveness, and its freedom from untoward results. In regard to the last mentioned consideration the use of a single dose of alum-precipitated toxoid as an immunizing agent has had extensive trial in infants and children, and many reports are available in the literature.[1-5] Observations on its use in young adults are much more limited. Report is therefore being made of the experience of the Students' Health Service at the University of Minnesota in immunizing 1,900 young men and women by this procedure.

The material which has been collected will be considered under 4 headings: (1) the immunization status of this group of young adults in Minnesota in the year 1935, (2) local and general reactions following the injection of a dose of alum-precipitated toxoid, (3) the dependability and significance of skin sensitiveness to toxoid (Moloney Test) [6] as a pre-immunization guide to the likelihood of a reaction,[7, 8] and (4) the immunizing value of 1 dose of alum-precipitated toxoid in this group of young adults as measured by a Schick reaction done 2 to 4 months later.

METHOD OF STUDY

In the fall of 1935, as a part of the entrance physical examination, a Schick test was performed routinely on each student. At the same time on the opposite forearm 0.1 c.c. of a 1 to 20 dilution of toxoid was injected intradermally according to the technic of Moloney and Fraser.[6, 7] The Schick material was commercially prepared by a single phar-

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 22, 1936.

FIGURE I

You recently received an injection of diphtheria toxoid at the Health Service, the purpose of which was to protect you against diphtheria. Usually this injection causes no unpleasant effects, but occasionally it may cause some slight discomfort. In order to make our information more complete, will you please supply the information requested below?

1. I noticed no ill effect.
2. I noticed those effects checked below:

(a)—Arm
Soreness ___ Slight___ Moderate___ Severe___
Redness___ Slight___ Moderate___ Severe___
Swelling. . _

(b)—Generalized symptoms
Headache ___ hours after injection which lasted_____
Backache
Chilliness
Fever___ Did you use a thermometer? If so, what was your reading?_____
General aching

Return to Students' Health Service through the University Mail

mercurial house, but it was not known whether all came from one batch of toxin. The diluted toxoid used for the reaction test was prepared from a single batch of commercially produced plain diphtheria toxoid. The original batch of toxin was not identical with that used for the alum-precipitated toxoid later used for immunization.*

The reaction about both points of injection was read in 48 hours and again at the end of 7 days. All of the readings were made by two individuals. All students showing a positive Schick test were advised to have an injection of alum-precipitated toxoid which was administered in a dose of 0.5 c.c. at the time of the last Schick reading and irrespective of the skin sensitiveness to toxoid.

Two weeks later each student who had received an injection of alum-precipitated toxoid was given a card asking specific questions about reactions, either local or general, which had occurred. Of the 1,900 students immunized, 1,336, or 70 per cent, responded with reports. Those who had had symptoms severe enough to be incapacitated had already reported to the Health Service dispensary for advice and care.

COPY OF RECORD

From 2 to 4 months later the 1,900 students immunized were notified to report for another Schick test to determine their immunity status.

Immunity Status as Determined by Schick Reaction—Students at the university come from all parts of the state. The group studied may therefore be considered as representing a fair sample of this population living under both urban and rural conditions. The diphtheria death rate has been falling steadily, and during 1934 reached an all time low of 0.61 per 100,000 population in the state as a whole.

DIPHTHERIA MORTALITY IN MINNESOTA
1910–1935

Of the group of 3,205 college students

* The term "Moloney test" will be used in this paper to denote the skin test reaction here defined.

TABLE I

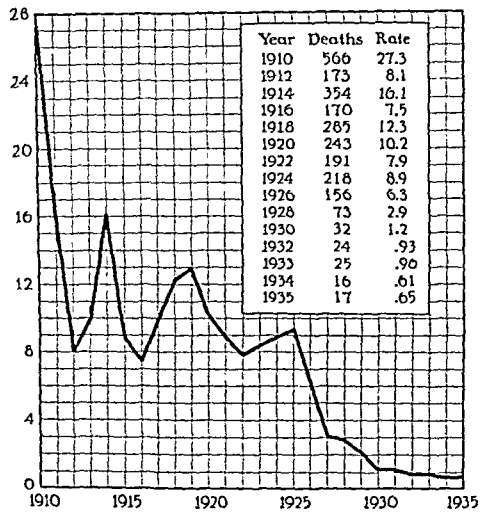
Positive Schick Test

	No History of Previous Artificial Immunization		*History of Previous Artificial Immunization*		*Total*	
	No. Tested	*Per Cent Positive*	*No. Tested*	*Per Cent Positive*	*No. Tested*	*Per Cent Positive*
Male	1,400	78.8	853	57.3	2,253	70.7
Female	574	79.2	378	52.6	952	68.7
Total	1,974	79.0	1,231	55.9	3,205	70.1

on whom the Schick test was performed during the routine examinations 70.1 per cent were positive. Of this number 1,231, or 38.2 per cent, gave a history of having been artificially immunized against diphtheria at some time during their previous life. In our experience, a history of immunization procedures which may have been done during childhood is very unreliable. The material used for this immunization and the time at which it had been given could not be accurately ascertained. It is quite questionable whether 38.2 per cent had actually received diphtheria immunization.

If those who gave a history of previous artificial immunization are eliminated from consideration, of the remaining 1,974 students, 79 per cent showed a positive reaction. In other words, only 21 per cent had become immune through natural exposure. This figure is lower than those obtained by other observers upon comparable groups in other parts of the United States. It would seem to reflect a very low natural exposure rate at this time in Minnesota. Furthermore it is notable that among those who gave a history of previous artificial immunization 56 per cent were still Schick positive.

FIGURE II



Local and General Reactions Following One Dose of Alum-Precipitated Toxoid—Of 1,900 students who were given a 0.5 c.c. dose of alum-precipitated toxoid, only 34 subsequently reported because of severe reactions. Of these, only 5, or 0.26 per cent, had severe enough reactions, either local or general, to be hospitalized. Five others developed sterile abscesses at the site of injection. In 2 the abscesses opened spontaneously, the other 3 were incised. In each case, as soon as the abscess had been opened and drained, healing took place quickly and in no instance was it necessary to have a dressing applied more than 4 days.

Two weeks after being inoculated, a questionnaire was sent to each student asking for a report on subjective symptoms thought to be due to the toxoid. Of the 1,336 reporting, 20.8 per cent stated they had no ill effect. The remaining 79.2 per cent reported

TABLE II

Reactions to Alum-Precipitated Toxoid

	Number	Per Cent
Total number immunized	1,900	100.0
Number reporting to dispensary because of reactions	34	1.7
Number hospitalized because of reactions	5	0.26
Number of sterile abscesses	5	0.26
Number answering questionnaire regarding reactions	1,336	70.3
Reporting no ill effect	279	20.8
Reporting either local or general reactions or both	1,057	79.2

either local or general reactions of varying severity as indicated in Table II.

The reason some individuals have local or general reactions following the injection and others have no ill effects, is not entirely clear. It has been generally assumed that the two most important causes are: (1) specific sensitization to some protein in the toxoid preparation, or (2) a general allergic state of the individual. In Table III the subjective symptoms following alum-precipitated toxoid are presented in relation to the allergic history of the individual. A positive allergic history here indicates either a history of allergy in the family, or in the individual, or both.

Although the percentage of local and general reactions is slightly greater in the group giving a history of allergy as compared with the group which did not, the differences are not great enough to be statistically significant. It is inferred, therefore, that the constitutional factor as indicated by such a history is relatively unimportant in relation to the occurrence of a reaction following the immunizing procedure.

Table IV presents the reactions following alum-precipitated toxoid correlated with the interpretation of the pre-immunization Moloney test.

Of those showing positive Moloney tests, 10.4 per cent subsequently reported that they had no ill effects from the alum-precipitated toxoid as compared with 22.3 per cent of those with negative Moloney tests. Local reactions such as soreness, redness, or swelling of the arm with or without constitutional reactions, such as headache, backache, chilliness and fever, were reported more frequently in the group with positive than in the group with negative tests.

In other words, the test was of some value in indicating those who were

TABLE III

Reaction to Alum Precipitated Toxoid According to Allergic History

	Positive Allergic History			*Negative Allergic History*				
	No.	*Per Cent*	*P.E.*	*No.*	*Per Cent*	*P.E.*	*Difference*	*Difference / P.E. Dif.*
Total number	583			684				
No ill effect	113	19.4	±1.1	149	21.8	±1.1	+2.4±1.51	1.6
Local Reactions:								
Severe soreness	70	12.0	±0.9	59	8.6	±0.7	—3.4±1.14	3.0
Severe redness	36	6.3	±0.7	29	4.2	±0.5	—2.1±0.81	2.6
Swelling	247	42.4	±1.3	280	40.9	±1.3	—1.5±1.85	0.8
General Reactions:								
Headache	55	9.4	±0.8	55	8.0	±0.7	—1.4±1.04	1.3
Fever	38	6.5	±0.7	42	6.1	±0.6	—0.4±0.94	0.4
General aching	48	8.2	±0.7	44	6.4	±0.6	—1.8±0.94	1.9

TABLE IV

Reactions to Alum Precipitated Toxoid

Correlated with Skin Sensitiveness to Toxoid as Shown by Pre-immunization Moloney Test

Subjective Symptoms Reported by Students

	Moloney Test +		*Moloney Test —*			
	No.	*Per Cent*	*No.*	*Per Cent*	*Difference*	*Difference / P.E. Dif.*
Total number	163	12.2	1,173	87.8		
No ill effect	17	10.4±1.6	262	22.3±0.8	—11.9±1.74	6.8
Local Reactions:						
Soreness—						
slight	37	22.7±2.2	445	37.9±0.9	—15.2±2.41	6.3
moderate	58	35.6±2.6	329	28.0±0.9	+ 7.6±2.70	2.8
severe	42	25.8±2.3	94	8.0±0.5	+17.8±2.34	7.6
Redness—						
slight	40	24.5±2.3	279	23.8±0.8	— 0.7±2.42	0.3
moderate	47	28.8±2.4	157	13.4±0.7	+15.4±2.51	6.1
severe	26	16.0±2.0	36	3.1±0.3	+12.9±1.97	6.5
Swelling	95	58.3±2.6	447	38.1±0.9	+20.2±2.79	7.2
General Reactions:						
Headache	31	19.0±2.1	81	6.9±0.5	+12.1±2.14	5.7
Backache	13	8.0±1.4	25	2.1±0.3	+ 5.9±1.43	4.1
Chilly	24	14.7±1.9	31	2.6±0.3	+12.1±1.90	6.4
Fever	27	16.6±2.0	53	4 5±0.4	+12.1±1.99	6.1
General aching	27	16.6±2.0	72	6.1±0.5	+10.5±2.00	5.3

more likely to have reactions, but was not specific in this regard. Even if the test were positive in an individual it did not invariably or even usually follow that if the alum-precipitated toxoid were injected, a severe reaction would result.

These results led us to inquire as to whether this test, like the reactions to the injection of alum-precipitated toxoid was related to (1) skin sensitiveness in individuals who had some previous indication of the allergic state, or (2) specific sensitization to diphtheria protein.

Table V shows the relation between a positive Moloney test and personal or family history of allergy, by sex. It is evident that such a history has little if any bearing upon the result of the test.

The relation between a positive Molo-

TABLE V

Relation Between Allergic History and Moloney Test by Sex

	Positive to Moloney Test				*Negative to Moloney Test*			
	Male		*Female*		*Male*		*Female*	
	No.	*Per Cent*	*No.*	*Per Cent*	*No.*	*Per Cent*	*No.*	*Per Cent*
Family History of Allergy	137	32.5	78	37.5	618	33.7	264	35.4
Personal History of Allergy	41	9.7	39	18.7	189	10.3	104	13.9
No History of Allergy	243	57.7	91	43.7	1,025	55.9	376	50.5
Total	421	99.9	208	99.9	1,832	100.0	744	100.0

TABLE VI

Schick and Moloney Test—Relation to Previous Diphtheria Immunization

	No Previous Immunization Moloney Test +			*History of Previous Immunization Moloney Test +*		
	Total	*No.*	*Per Cent*	*Total*	*No.*	*Per Cent*
Schick +						
Males	1,104	93	8.4	489	93	19.0
Females	455	57	12.5	199	49	24.6
Total	1,559	150	9.6	688	142	20.6
Schick —						
Males	296	118	39.9	364	117	32.1
Females	119	44	37.0	179	58	32.4
Total	415	162	39.0	543	175	32.2

ney test and some previous experience with the protein of the diphtheria bacillus either through artificial immunization or a natural contact sufficient to produce a negative Schick test. is presented in Table VI.

Among those who were Schick positive and gave no history of artificial immunization and who therefore constitute the group which have had the least opportunity for previous contact with diphtheria protein, the percentage of Moloney positives is lowest —9.6 per cent. Even though the Schick was still positive, but there was a history of previous artificial immunization, the percentage of positive Moloneys was increased to 20.6 per cent. Among the groups who were Schick negative with or without a previous history of artificial immunization the percentage of Moloney positives was highest. There is evidently a high degree of correlation between previous contact with diphtheria organism or its products and the occurrence of a positive Moloney reaction.

FOLLOW-UP SCHICK TESTS IN STUDENTS GIVEN 0.5 C.C. OF ALUM-PRECIPITATED TOXOID

Six hundred and thirteen students with positive Schick tests who had been given 0.5 c.c. of alum-precipitated toxoid were given subsequent Schick tests from 2 to 4 months after the inoculation. Of the entire group, 88.9 per cent had become Schick negative. The degree or duration of this immunity has not been determined. The percentage of these young adults made Schick negative by one dose of alum-precipitated toxoid is not as great as that reported for younger children.[1-5]

TABLE VII

Schick Test 2–4 Months After 0.5 c.c. of Alum Precipitated Toxoid

	Male		*Female*		*Total*	
	No.	*Per Cent*	*No.*	*Per Cent*	*No.*	*Per Cent*
Schick —	389	87.6	156	92.3	545	88.9
Schick +	55	12.4	13	7.7	68	11.1

SUMMARY

1. Of 3,205 young adults tested at the University of Minnesota in 1935, 70.1 per cent had positive Schick tests. Of the entire number 1,231 gave a history of having been artificially immunized.

2. Of the Schick positive students 1,900 were given 1 dose of 0.5 c.c. of alum-precipitated toxoid. Local or general reactions severe enough to make the student seek medical care in the Health Service dispensary occurred in 34, or 1.7 per cent. In 5, or 0.26 per cent, sterile abscesses developed.

3. There was no correlation between the personal and family history of allergy and the reactions following the injection of alum-precipitated toxoid.

The percentage of local and constitutional reactions following the inoculation of alum-precipitated toxoid was significantly greater in those who showed positive as compared with those who showed negative Moloney tests. However, 10 per cent of those students who had positive Moloney tests reported no reaction, and 70 per cent local or general reactions of little importance.

4. A positive Moloney test shows little or no correlation to personal or family history of allergy.

The Moloney test shows a high degree of correlation with previous exposure to diphtheria proteins as indicated by a negative Schick test or a history of artificial immunization.

5. Follow-up Schick tests were given to 613 students from 2 to 4 months after 1 injection of 0.5 c.c. of alum-precipitated toxoid—88.9 per cent of the group had become Schick negative. The degree or duration of this immunity was not determined.

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Vitamin Advertising

THE present spectacle of vitamin advertising running riot in newspapers and magazines and via radio emphasizes the importance of the physician as a controlling agent in the use of vitamin products.

Mead Johnson & Co. feel that vitamin therapy, like infant feeding, should be in the hands of the medical profession, and consequently refrain from exploiting vitamins to the public.—*Bull.* San Diego Co. Med. Soc. Mar. 5, 1937.

Working Environment*

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ECHOES of the effects of working environment on health rumbled down through the centuries to our very gates. Little was actually done, however, to remedy the untoward effects of working environment on health. In this country it is only within the past 25 years that a real development has taken place. Previous to this time most of the efforts put forth to remedy conditions of working environment concerned themselves largely with improvements of conditions readily observable by mere inspection.

Hamilton's survey in Illinois in 1910, and Hayhurst's of Ohio in 1915 provided startling evidence of the effects on the industrial worker of exposure to toxic materials.

This period saw the formation of a division of industrial hygiene and sanitation in the U. S. Public Health Service, the organization of the Bureau of Mines, the inclusion of courses in industrial hygiene as part of public health work in universities, the inclusion of a Section on Industrial Hygiene in the American Public Health Association, the first Workingmen's Compensation Laws, the formation of a Committee on Industrial Hygiene in the Conference of the State and Provincial Health Authorities, and the development of statistics of the vast number of those potentially exposed to occupational diseases, the many and various materials and processes potentially hazardous to health, and the variety of the hundreds of occupations representing possible exposure.

In the latter part of this time a more scientific approach was made to the problem. It was not enough to know that workers were exposed to materials or processes that would affect health or to know the actual pathology and end result of exposure, it was necessary to know the mechanism of the effects of these materials. In addition to qualitative methods, information that could only be determined by quantitative means was essential—to tie up and correlate pathology with the amount and degree of exposure. Quantitative information on the threshold amount of these materials that would cause disease was necessary before sound methods of control could be instituted in industrial environment to prevent and control the occurrence of disease, for while compensation was important, prevention was the end result to be sought for.

The mechanism of lead poisoning was given us by Aub, Kehoe, and Fairhall; of dusts by Gardner, Lanza, Pancoast, Pendergras; quantitative information on noxious gases by Henderson and Haggard; surveys, studies, and research work of the U. S. Public Health Service gave us information of the effects of

* Address of the Chairman of the Industrial Hygiene Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 20, 1936.

dusts and other toxic materials definitely correlating the effects of specific amounts of hazardous materials on health in quantitative terms. The surveys, studies, and research work of the Bureau of Mines in dusts, gases, and organic solvents, added to our knowledge. The committee reports of the Section of Industrial Hygiene of the American Public Health Association have gained world-wide recognition as being authoritative and unbiased and representative of the best brains the country affords in industrial hygiene. Many universities, notably California, Cincinnati, Columbia, Harvard, Johns Hopkins, Pennsylvania, and Yale, some of the larger insurance companies, and industry itself added to the veritable flood of material poured out—particularly in the latter part of this period. It became evident that here was a public health problem of first importance, affecting the morbidity and mortality of millions of people.

Control of conditions so seriously affecting such a large group of the productive population cannot properly be undertaken except by an agency experienced in disease control. The control of communicable disease has always been recognized as a function of the health department. This control is purely for prevention of disease and death.

Occupational disease control represents exactly the same close relationship to the health of the adult population as communicable disease control does to the health of the child population.

At the present time the greatest morbidity and mortality are not associated with childhood but with chronic degenerative diseases which appear in adult life and are particularly rampant in the industrial working classes.

Ten years ago L. R. Thompson of the U. S. Public Health Service stressed the necessity of undertaking industrial hygiene work as part of the preventive program of health departments.

Haven Emerson in his presidential address before the American Public Health Association [1] stressed the importance of incorporating "within the permanent functions of health departments protection of employed persons against health handicaps inherent in the place and nature of their work."

Resolutions have been passed by the Conference of State and Provincial Health Authorities, the American Public Health Association, and the American Medical Association recognizing the necessity of including the control of occupational disease as an integral part of a complete public health program.

Health authorities have developed a mechanism for the control of occupational diseases just as they have for the control of communicable diseases; the application of precise physical and chemical procedures to conditions affecting health in industrial environment by specially trained technical personnel. The effect is known of many of the potentially hazardous materials with definite data relative to the threshold dose and limits of exposure. Control of industrial environment to maintain the exposure of the individual within safe limits is accomplished by the institution of modern scientific principles of preventive medicine.

The Industrial Hygiene Committee of the Conference of State and Provincial Health Authorities of North America, formed in 1921, has been exceedingly active in this phase of public health work in the last decade. Statistics have been gathered on the number of individuals potentially affected by toxic materials in the various states. The health officers have been informed of the developments in industrial hygiene; the committee has worked out the qualifications of the personnel necessary to

undertake this work, the laboratory facilities required, and the costs, and in addition has provided its members with a bibliography of the important modern works on industrial hygiene.

For the past several years health officers have been faced with the difficult task of securing sufficient appropriation for personnel and technical facilities to carry on their activities. In the short time Social Security funds have been available for public health purposes, 17 states have secured funds for industrial hygiene purposes and now have laboratory facilities and technical personnel in their departments of health organized specifically for the prevention and control of occupational diseases.

This has not been a development of a day or a year, or a decade. Preventive medicine is the gradual development of the centuries, and prevention of occupational disease today consists of the presentation of definite facts, predicated upon precise physical and chemical determinations of the industrial environment, interpreted in terms of occupational disease control by a technically trained personnel and enforceable in such a way that the enforcement does not give rise to injuries or injustices more serious than the abuses it aims to correct.

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New Federal Aid for Health and Sanitation

IN February the United States Congress enacted a law creating a Disaster Loan Corporation. Following this action Congress also passed a Joint Resolution authorizing the U. S. Public Health Service to use funds from the First Deficiency WPA Appropriation Bill for health and sanitation work in the 177 counties of the Flood Areas:

Resolved, etc., That the President is hereby authorized to allocate funds to the U. S. Public Health Service for health and sanitation activities in the areas recently stricken by floods from the appropriation made in the Emergency Relief Appropriation Act of 1936, as supplemented by the appropriation for relief and work relief in the First Deficiency Appropriation Act, fiscal year 1937, for the following purposes: (1) Grants to States for the purpose of aiding such States, or any county, health district, or other political sub-division thereof, in establishing and maintaining adequate public health services in the prevention and control of diseases in the areas recently stricken by floods, under regulations prescribed by the Surgeon General of the U. S. Public Health Service; (2) the employment of personnel in the City of Washington and elsewhere, without regard to the civil service laws and regulations and the Classification Act of 1923, as amended, to replace commissioned officers and other employees of such Public Health Service detailed to such areas; (3) reimbursement of appropriations of such Service for expenditures made from such appropriations for emergency work in such areas; and (4) the purchase of supplies and equipment to replace articles furnished from stock on hand for the care, support, and maintenance of flood refugees and in rendering assistance to health authorities.

The allocations made by authority of this joint resolution shall not be exclusive but shall be in addition to those which otherwise may be made under the provisions of such Emergency Relief Appropriation Act of 1936, as supplemented.

EDITORIAL SECTION

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FEDERAL LEGISLATION TO CONTROL FOODS, DRUGS, AND COSMETICS

The Copeland Bill

SINCE June, 1933, a number of bills to modernize and strengthen the Federal Food and Drug Act of 1906 have been considered by the Congress of the United States. One of these measures, Senate Bill 5, was passed by the Senate on May 28, 1935, but more than a year elapsed before it was acted upon by the House of Representatives. In the closing days of the 74th Session, the House passed this bill in an amended form. A compromise measure suggested by Senator Copeland was then adopted by the Senate, but failed to pass the House on June 20, 1936, the day Congress adjourned.

A new S. 5 was introduced in the 75th Congress by Senator Copeland, and on March 9, 1937, was passed in the Senate. This bill, to prevent the adulteration, misbranding, and false advertisement of food, drugs, devices, and cosmetics in interstate, foreign, and other commerce subject to the jurisdiction of the United States, to safeguard public health, and prevent deceit upon the purchasing public, is a distinct improvement over existing law, although it contains some serious defects.

In addition to prohibiting the adulteration and misbranding of foods, drugs, devices, and cosmetics shipped in interstate and foreign commerce, this bill also prohibits the dissemination by the mails or in interstate commerce in any manner or by any means, including radio broadcast, of any false or misleading advertising of these products. Advertising which represents any drug or device to have any therapeutic effect in the treatment of Bright's disease, cancer, tuberculosis, poliomyelitis, venereal diseases, or heart or vascular diseases is absolutely prohibited except to the medical, dental, and pharmaceutical profession.

These excellent provisions are, we believe, weakened somewhat by a clause stating that any representation concerning the effect of a drug or device shall be deemed to be false and misleading if not supported by persons who, by reasons of scientific training and experience, are qualified as experts on the subject to which such representation relates. There are, unfortunately, pseudo-experts as well as real experts whose opinions might prevail in such matters.

A new method of enforcement is authorized, in addition to the usual criminal prosecution and the seizure and multiple seizure, by process of libel, of products violating the terms of the law. The several district courts of the United States are vested with jurisdiction to restrain by injunction the violation of provisions of this law.

General enforcement of the law is properly given by this bill to the Secretary of Agriculture, but it is stated that nothing in the act shall impair or diminish the powers of the Federal Trade Commission under existing law. A controversy as to whether the advertising features of the proposed law should be enforced by the Federal Trade Commission or the Secretary of Agriculture was chiefly responsible for the failure of the bill to pass in the 74th Congress.

The extended provisions of the bill regarding foods are, in general, comparable to those in the present law, with numerous additions and improvements. Thus, foods for special dietary purposes, or for use by infants and invalids may be required by regulation to be labelled with statements concerning their mineral, vitamin, and other dietary properties. Standards for the identity and quality of food are provided for, and labeling of unstandardized food to disclose ingredients is required. Traffic in food dangerous to health is prohibited, as is also the addition of poison to food, or the use of poisonous containers.

Among other interesting provisions in this bill is one forbidding traffic in confectionery containing metallic trinkets and other nonnutritive substances, except harmless coloring, that may be dangerous to health. Artificial colors and flavors in foods must be declared on labels, and all foods must be prepared and handled under conditions of reasonable cleanliness. Emergency license control is authorized for foods that might be contaminated during manufacture, where their injurious nature cannot be determined after the articles have entered interstate commerce.

Certain of the drug sections of this bill have been criticised by the organized medical profession because the bill permits a drug to differ from the standards set forth in an official compendium, provided its strength and quality are plainly stated in the label.[1] It is difficult to see how such labeling would protect a purchaser of a hyper- or hypo-potent drug. Similarly, no provision is made for setting up definite standards for therapeutic devices, many of which may present hazards as well as benefits to health.

Cosmetics under the proposed law include all beautifying agents except soaps intended only for cleansing. In defining adulteration of a cosmetic, there is an exemption for coal-tar hair dyes, provided they are labelled with the caution that they may cause skin irritation on certain individuals and should be tested for such reactions.

Despite its few shortcomings, the Copeland bill, S. 5 is a noteworthy advance over the existing law. It is superior to other bills that have been introduced to amend the Food and Drug Act, particularly some now pending in the House; and it deserves general support. Aside from its effects in strengthening the law

of 1906 in a number of important aspects, this bill offers valuable control over improper advertising of foods, drugs, and cosmetics, and provides for the first time a reasonable means of regulating the previously unregulated cosmetics.

Sanitarians should advocate the passage of this federal legislation, the principles of which have been indorsed by this Association.[2] It is to be hoped, however, that the bill may be amended in some of the particulars mentioned, if it has not already been so amended by the time this editorial is published.

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THE NASAL CARTILAGES IN MAN

IN our review of *An American Doctor's Odyssey*, by Victor Heiser,[1] we criticised the statement that the Negro has an undivided cartilage at the end of his nose and that this was a sure test of Negro blood, extending even to octoroons. We stated that it was not true of the Negro as found in America.

The correctness of this criticism having been questioned, a fairly extensive correspondence with anatomists in the United States has been carried on. Dr. Aleš Hrdlička Division of Physical Anthropology, U. S. National Museum, has been good enough to give me the following quotation:

> Racial differences in the nasal cartilages of man have already been described by a number of authors, notably by Virchow ('12; whites and Negro) ('13; Japanese), Schultz ('18; whites and Negroes), Burkitt and Lightoller ('23; Australian aboriginal), v. Eickstedt ('26; Melanesians and Negroes), and Wen ('30; white and Negroes). On the basis of these reports it appears that in general the nasal cartilages are relatively larger in whites than in the colored races, that the roof cartilage of the former tends to assume a quadrangular (trapeze) shape, whereas that of the latter most frequently a triangular shape, that the lower border of the wing cartilage is more nearly horozontal in whites than in other races, and that the free, anterior border of the septum cartilage is more prominent and more curved in the former than in the latter. Furthermore, the mostly small, interculated cartilages of irregular size and distribution along the upper and posterior border of the wing cartilages are much more common in whites than in colored races and are extremely rare in other primates. According to the report by Meriel ('25) on the nasal cartilages of forty white, interculated cartilages occur in 80 per cent of the cases.[2]

In addition to this, Dr. Hrdlička has given 9 references which are at the disposal of anyone interested in the matter. We trust that will serve to correct for our readers at least the mistake made in *An American Doctor's Odyssey*.

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MUDDLED INFORMATION ON HEALTH

IN the March, 1937, issue of the pocket-sized magazine, *Coronet*, there is a pocket-minded article under the misleading title, "Is Milk Cancer's Ally?" This masterpiece of misinformation has been roundly condemned in an excellent editorial in a recent issue of the *Journal of the American Medical Association*.[1] Not only are we glad to join in that well merited condemnation, but consider it a public health duty to do so.

In the long history of popular presentations of health material, there have probably been few more stupid articles than this one. Aside from the fact that

an author unknown to science, who obviously has a superficial and generally erroneous knowledge of both cancer and milk, has thrown together a collection of fallacies on these topics, the article is vicious in that it will cause fear in the minds of many lay readers who are unaware of the craving for sensationalism that apparently was the only motive for this particular diatribe.

Most editors of popular magazines, fortunately, realize that they owe a duty to their readers to give only authentic and reliable facts when they present information on the important subject of human health. Contrast the attitude of the editor of *Coronet* in printing this poppycock with that of the National Association of Science Writers, which recently asked the Cancer Council of the American Society for the Control of Cancer to answer certain significant questions.

One of these questions concerned the effect of diet on cancer. The reply was that no experimental data have ever been obtained to justify the acceptance of any theory that there is a positive relationship between diet and cancer.[2] The editor of *Coronet* might have ascertained that indisputable fact before printing the hokum that he has printed.

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WESTERN BRANCH A.P.H.A. MEETING

THE Western Branch, American Public Health Association, will hold its Eighth Annual Meeting in Phoenix, Ariz., April 13–15. The meeting will be a joint one with the Arizona and the New Mexico Public Health Associations, each of which will hold a one day session on April 12. This is the first time that the Western Branch has met in the Southwest, and the committee on local arrangements, under the chairmanship of Dr. George C. Truman, is making elaborate preparations. The meeting will immediately follow the annual Surgeon General's Conference and the Conference of State and Provincial Health Authorities of North America in Washington, D. C. It will also follow the meeting of the California Tuberculosis Association in Riverside, Calif., on April 1–3. Those attending the Washington meetings may wish to return to the West via Phoenix, and those attending the California Tuberculosis Association meeting may wish to motor to Phoenix, spending a day or so at Boulder Dam and at the Grand Canyon, each of which is reached by easy stages en route to Phoenix. Phoenix is a beautiful city of nearly 50,000, the state capital of Arizona, in the heart of historic Indian country, and on the trail of the Apaches and the Spanish Conquistadores.

The program this year presents a departure from previous Western Branch meetings. It will present two or not more than three papers on major subjects at each of the scientific sessions, allowing ample time for formal discussion and for discussion from the floor. Among the topics to be covered are: "A Mental Hygiene Plan Suitable for State and Full-time Local Health Departments," "Industrial Tuberculosis, its Incidence and Prevention," "Official Public Health Nursing Programs," "Recent Progress in the Treatment of Pneumonia," "Public Health Legislation," "A Venereal Disease Control Program for State and Full-time Local Health Departments," "Recent Advances in Public Health Administra-

tion," and "The Effects of Residence Allocation on Death Rates from Certain Diseases."

Dr. H. E. Young of Victoria, B. C., President of the Western Branch, will preside at all general sessions. Dr. Platt W. Covington of the Rockefeller Foundation, Salt Lake City, is President-Elect of the Western Branch and Chairman of the Committee on Meetings and Publications.

Current reports from the special committees of the Western Branch will be presented at this meeting. These will include those of the special Committee on Sylvatic Plague, the Committee on Health Education, with a sub-committee report on the technics of using the radio for health education messages, the Committee on Public Relations, and the Committee on Public Health Exhibits for the 1939 San Francisco Bay Exposition.

The newly formed Laboratory Section of the Western Branch, under the Chairmanship of Dr. W. H. Kellogg, will hold one or two special sessions. There is the possibility of the formation this year of a Vital Statistics Section of the Western Branch.

Officers of the Branch are:

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IN THE MAY ISSUE

Recent Progress in Health Education
W. P. Shepard, M.D.

Uses of the Life Table in Vital Statistics
Louis I. Dublin, Ph.D., and *Alfred J. Lotka, D.Sc.*

Obstacles and Aids to Communicable Disease Nursing
Alma C. Haupt, R.N.

Institutional and Other Small Water Treatment Plants to Meet Unusual Conditions
Frank R. Shaw, C.E.

A Critical Study of Various Types of Detergents and Disinfectants for Use in Dishwashing
W. L. Mallmann, Ph.D.

Summer School Courses in Public Health

LETTER FROM GREAT BRITAIN

TRENDS IN RELATION TO PUBLIC HEALTH

Schemes for housing the people of this country being well forward, opportunity is now being taken to give attention to other matters. These activities on the part of other nations suggest that it is necessary for us to deal with them if we are not to be left limping hopelessly behind. Admonished by directors of physical education who have been impressed by the sight of foreign stadia full of hefty females keeping themselves fit by carrying out physical exercises of an astonishing complexity, government departments have concluded that what this nation is short of is physical fitness. At the same time also, certain physiologists and dieticians have created a belief in many minds that—mainly because of the ignorance of the average housewife of the elementary rules of dietetics, economics and household management, and incapacity to apply them even if she knew them—there is real reason for concern as to the state of large sections of the population so far as regards nutrition. As a result, efforts are being made to discover a means of coping with this problem, and numbers of investigators, official and other, are engaged in investigating and publishing reports, some of which show there is really not very much wrong, while others reveal with equal clearness that conditions are extremely unsatisfactory, and unless and until something drastic is done it will be useless to attempt to secure physical fitness or anything else.

NUTRITION

Very naturally it is upon children that the bulk of the investigating is done, and to them that efforts to secure improvements in nutrition are directed. For a number of years annual reports of district medical officers of health and school medical officers, as well as those of the Chief Medical Officer of the Board of Education, have contained details of special enquiries into the state of nutrition of groups of school children and the operation of schemes for supplying milk in schools. The annual report of Sir Arthur MacNalty, Chief Medical Officer of the Board of Education, for 1935 is particularly informative in both regards. The general conclusion reached in respect of nutrition is that though it is difficult to make a quite accurate assessment and comparison, conditions are very far from so bad as many fear and, indeed, allege. In London, of 189,203 children examined, some 5.67 per cent were marked as " slightly subnormal," and 0.08 as "bad." The percentage of " normal " was 76.89, and of " excellent " 17.36. In the country as a whole, 88.7 per cent were marked normal or excellent, 10.6 slightly subnormal, and 0.7 bad. The extent to which free meals were provided during 1935–1936 was somewhat less than in 1933–1934 and 1934–1935. This is taken to suggest that conditions in 1935–1936 were definitely better than in 1933–1935.

MEALS AND MILK FOR SCHOOL CHILDREN

In 1935–1936 the total number of solid meals was 23,000,000 as against 25,000,000 in 1934–1935. Of solid and milk meals combined on the other hand, there was an increase in the number provided free from 68,000,000 in 1934–1935 to 87,000,000 in 1935–1936. This

was entirely due to milk meals which had increased as a result of the operation of the milk-in-schools scheme. Under this, school children are provided with one-third of a pint of milk for a halfpenny or, under certain circumstances, free. Introduced in October, 1934, this scheme worked with great smoothness and met with immediate success, large numbers of children taking advantage. Unfortunately, as time has gone on enthusiasm has waned somewhat and the percentage of elementary school children taking milk under the scheme which at 31st March, 1935, was 48.7 declined to 45.8 at 31st March, 1936. Sir Arthur MacNalty quotes from a number of reports showing that milk drinking has led to improvement both in health and mentality on the part of those indulging in it. At the same time, however, it is clear that he regards with some misgiving a decline in the numbers of drinkers in the first full twelve months of working. More particularly it appears to him regrettable that of those who pay for and take milk when school is open, only some 12 per cent attend for it during holiday time. The fact that there are children who have a distaste for milk, or who for one reason or another will not have it or go off it, he regrets also. As a suggestion to meet some at any rate of these objections Sir Arthur offers that flavouring agents of one sort or another might be tried.

DRINKING HABITS OF CHILDREN

Interestingly enough, quite recently there has been issued by the Hannah Dairy Research Institute in Scotland a report on "An Inquiry into the Drinking Habits of Children of School Age, with Special Reference to Milk Drinking," conducted by Dr. Norman C. Wright, in which there are references to attempts made to stimulate flagging milk appetites in this way. From the report it appears that the results were not encouraging, any increase in demand being only short lived. The findings generally seem to have been of a type that did not make for enthusiasm. Scottish children of school age, it seems, are not greatly given to milk drinking. Actually of 13,317 included in the enquiry, over 50 per cent did not drink milk at all, and of the remainder, two-thirds only took it once a day. The favourite beverage apparently was tea; cocoa was seldom drunk, and coffee practically not at all. In Scotland, as in other parts of the country, the milk-in-schools scheme makes provision for supplying milk free as well as at a small fixed charge. In this connection it is interesting and perhaps encouraging also to record that the decrease in demand for milk noted was exclusively among the children who pay, the number receiving free milk showing a progressive increase. The comment that might be made here is, of course, obvious. In the report, however, it is not made, the conclusion reached and put forward being universal distribution of free milk to all children attending state-aided schools. This course is urged and claimed as essential for the ultimate success of the milk-in-schools scheme. Though there are certain legal difficulties in the way of the putting into operation of such an arrangement, the main obstacle, I imagine, would be financial. That and a feeling that there was something in the nature of pauperisation involved, or that if it could be so very freely dispensed, milk could not be so important as was pretended. Intended to deal with the drinking habits of school children, this report contains an amount of information with regard to their eating habits as well. This adds very greatly to its interest and value.

HEALTH OF THE ENGLISH SCHOOL CHILD

Sir Arthur MacNalty in his report, perhaps I should mention, discusses a variety of other subjects than nutrition This its title—The Health of the School Child—reveals. Next after nutrition, in fact, he takes up Physical Education and Health Education and, having described under the head of "Medical Inspection and Treatment" what was done during 1935 in these connections, he provides a review of activities and results in relation to Welfare of Young Children; the Orthopaedic Service; Acute Rheumatism; the School Dental Service; and Mental Deficiency. The opening remarks of Sir Arthur in his introduction, emphasize the need for full recognition of physical education in the school curriculum, for the provision of proper facilities and for fully trained teachers, all of which he claims as essential to the future development of physical education. In the special section on physical education and health education it is shown that endeavour is being made to meet the view of the Board of Education that the services of an organiser of physical education should be available in every area. Actually, at the beginning of 1936 over half of the authorities had made appointments and since then many additional proposals had been submitted to the Board. In the same section details are given of the extensive provision made for health education by health and education authorities. Arrangements for carrying out medical inspection and treatment in this country, it is generally accepted, are very complete. The facts and figures contained in this report show that this belief is well founded. It is interesting to find, however, that at the moment there is a fairly widespread feeling that the time is ripe for modification in the scheme which has been in operation now for a number of years. In certain areas medical officers are engaged in trying out new schemes and there are hopes that something much more simple will be evolved. This will be to the advantage of the children; especially, however, it will be to the advantage of school medical officers who are liable to find the work of medical inspection terribly monotonous and themselves engaged merely in cataloguing defects.

THE SCHOOL MEDICAL SERVICE

At the moment the service consists partly of whole-time school medical officers and partly of officers giving part time. The total amount of time given is equivalent to the whole-time service of 687 officers, or approximately 1 to 7,140 school children in average attendance. In addition to the school medical officers there are 962 specialist medical officers, practically all part-time; 852 whole- and part-time school dentists (1 to 7,600 children), and a nursing staff equivalent to 2,386 whole-time school nurses. The total number of children passed under medical review in 1935 was 2,987,283, representing 60.9 per cent of the average attendance. Details of work done on behalf of some at any rate of the children found to be in need of attention are given in other sections of the report, information with regard to specialist work being contained in that relating to the orthopaedic service and in that on the work of the dental service. In the case of orthopaedics, though it is admitted that satisfactory progress has been made by a considerable number of authorities, Sir Arthur wants still more special open-air hospitals, orthopaedic clinics, remedial exercises clinics, and local associations of voluntary workers. Also he considers that still further attention should be given to prevention by increased facilities for physical training

and correction exercises, and more attention to hygiene, seating, and general school conditions. Reviewing dental work, the report shows that in 1935 there was one of the largest increases in personnel recorded in any single year to 646 officers from 604. Also for the first time in the history of the service the number of fillings in permanent teeth exceeded one million, being actually 1,028,309.

ACHIEVEMENTS OF THE SCHOOL MEDICAL SERVICE

In the final chapter, Sir Arthur seeks to provide an answer to a question often asked as to what the country is getting in return for the great sums expended on the school medical service. Without much difficulty he shows that the elementary school child is almost immeasurably healthier than was the corresponding child of 25 years ago. Moreover, from the mass of statistics there emerges that the school population is demonstrably becoming heavier and fitter, and this being so, it is difficult to resist the conclusion that it is becoming also healthier and fitter—at any rate physically. One particularly striking feature shown on looking back 10 years from 1935 to 1926 and comparing the statistics of the two is a diminution in the incidence of tuberculosis. Definite pulmonary tuberculosis, for example, which in 1926 showed a figure of 0.4 per 1,000 children examined, in the 1935 returns came out at 0.1 per 1,000. The figures for "suspected" pulmonary tuberculosis were 1.3 per 1,000 in 1926 and 0.4 per 1,000 in 1935. For non-pulmonary tuberculosis the rate per 1,000 of those medically inspected in 1926 was 1 and in 1935, 0.6. Speaking generally, Sir Arthur regards the results as encouraging. Further, he claims that the school medical service has a wonderful record of achievement in its past, adding, however, that great as this may have been there still remains much more to be done, since: "The younger generation is emerging into a more exacting and complex world than its parents faced in their younger days"; and, "To preserve the school child's mental and physical health for the struggle of life is at once the task and the privilege of the school medical service."

CHARLES PORTER, M.D.

PUBLIC HEALTH EDUCATION*

Be Up-to-Date—And Accurate—Quotation from a review of a recent health education book:

The bibliography in several instances does not give the latest revised editions of references.

Another review of a recent book says:

Materials such as printed matter, slides, and movies are carefully listed, but unfortunately some of the items are no longer issued.

Important books by leading health workers issued by prominent publishers have listed out-of-print material and motion pictures no longer available.

Result: many futile letters are written.

Something to Do Something About?—A boy's club cherry pie eating contest to celebrate Washington's birthday (!) aroused one almost "Constant Reader" of this department. C. R. did not call for "a law against" pie eating contests, but did urge that health and dietetic leaders "do something" to ruin the publicity values of such a contest.

Now Called by Its Right Name—*Editor and Publisher,* chief journal of the newspaper world, reported Feb. 13, 1937, that—

The nation-wide campaign of the press to rout syphilis was crystallized Feb. 3 when, for the first time, National Social Hygiene Day was observed in the United States.

In Chicago, the day was heralded as the result of the efforts of the *Tribune* to focus public opinion on venereal diseases. Not only was the *Tribune* given credit for being the first newspaper that dared to print the words syphilis and gonorrhea, but it was also credited by Dr. Frank Jirka, State Health Commissioner, for being the first to put these words on the air 6 years ago over WGN.

Today, however, the *Tribune* is not alone in its war on syphilis. Newspapers and magazines everywhere are turning the spotlight of publicity on this scourge.

The article goes on to review the recent past and present doings of leading newspapers in New York City, New Orleans, Memphis, Des Moines, Detroit, Cincinnati, St. Louis, San Francisco, Los Angeles, Boston, Pittsburgh. And as go the newspaper leaders in those cities, so go the newspapers generally throughout the country.

Clinic in These Columns?—As has been suggested, detailed but constructive criticism will be offered on health education material submitted for that purpose.

Address specimens to the editor of this department, accompanied by a postal card or letter.

No! Ca! Che!—Three Times No!—in Zulu and Sesuko, as well as English. These words are from a broadside on flies, impukane, or lintsi. This and other interesting educational material accompanied a letter from C. C. P. Anning, Medical Officer of Health, Benoni, South Africa, who says:

As a member of the Public Health Education Section of the Association, I read your monthly pages in the *Journal* with the greatest interest, and many of the ideas put

* Please address questions samples of printed matter, criticism of anything which appears herein, etc., to Evart G Routzahn, 130 East 22d St , New York, N. Y.

forward month by month are being adopted in my own department. Just in the same way that many of the stimulating ideas that I had the pleasure to collect during my Carnegie trip in 1935 in your delightful country are coming out now in the daily routine of work in this South African town. . . .

The town, of some 90,000 inhabitants, in which I am now Health Officer, is of recent growth—in the centre of Gold mining area—and we are just starting to build up our Health Services under the department's motto of "Through Education to Health."

The Low Cost of Giving—An editorial in *Hospitals* (18 E. Division St., Chicago, Ill.) for March, 1937, "The Low Cost of Hospital Giving," considers income tax deductions on gifts to hospitals and other institutions.

The donor may create a trust for the hospital he favors, which trust would be irrevocable, absolute, and indefeasible, and he may retain the income of the trust fund for life, and may deduct the amount of the gift from his gross income for the year in which the gift is executed. If the trust fund was $25,000, and the income on it was to go to the donor during his life and at his death the trust was to go to the hospital the present value of the trust, subject to the 15 per cent limitations, would be deductible from the gross income of the donor. Under existing favorable rulings as to methods of computation of deductible income the donor at the age of 50 years could give his hospital $25,000 at the net cost of approximately $12,000. Many philanthropists are influenced in making present gifts to hospitals by the low net cost of their giving.

Hospitals would do well to present a study of these costs to their friends and potential benefactors. Where the donor is very wealthy and his income is proportionately large, the present gifts he makes will cost him less than half of the amount given. In addition the hospital will enjoy the income from the present gift, which will add a considerable sum each year to its endowment income.

Prestige or Face-Saving — We have been asked if it is necessary for every local health department, or even every state department to write and print its own health education material.

This department answers, "No." The one argument for "Yes" is prestige, or "saving face." But is there prestige in sending out dull writing and poor printing?

If we must print our own leaflets or booklets is it necessary for us to prepare original copy—if better copy has already been written elsewhere?

After all, why not use some of the well prepared health printed matter issued by insurance companies, and others? Many health departments are doing this. Many of them have distributed *Readers' Digest* reprints of Dr. Parran's syphilis article. Many health agencies use material issued in quantity by national health associations.

Not nearly so many reproduce publications issued originally by other health agencies.

Must some of us continue "face saving" and work harder and spend more money to do so?

Health in Advertising Awards—The Annual Advertising Awards are sponsored by *Advertising and Selling*, 9 East 38th St., New York, N. Y., outstanding journal in the advertising field.

The Public Health Institute, 159 N. Dearborn St., Chicago, Ill., was given a medal award

for a campaign which contributes most to the advancement of advertising as a social force.

Objectives: To induce victims of venereal diseases to make use of the Institute's facilities; to protect those without means for private physicians from quacks and unscrupulous druggists; to inform the general public of venereal dangers.

Appeals: Personal fear; the Institute's non-profit, humanitarian character; its record of treatment.

Parke, Davis and Company, received honorable mention for the advertisements which our readers have seen. Other advertising with health implications was given honorable mention.

A medal award went to World Peaceways, 103 Park Ave., New York, N. Y., for a remarkable series of anti-war advertisements appearing in national magazines.

In *Advertising and Selling* for Feb. 25, 1937. *50 cents* for this issue.

Silence No Longer — Apparently broadcasting and journalism are no longer inhibited in speaking of social disease. At least the widespread celebration of Social Hygiene Day suggests that syphilis and venereal disease word blacklisting is more the exception than the rule.

It is now up to health workers and their allies to make the best of the opportunity. Good taste and effective educational methods are called for as much as ever in the past. We need to be on guard against indiscreet friends, as well as quacks.

Please send us samples of what you say or print on the subject.

Hygeia, March, 1937—Published at 535 N. Dearborn St., Chicago, Ill., at *25 cents* a copy:

Health in the flood area (Louisville) . . . Diphtheria: unnecessary death . . Curious stories about health . . . It's the way you walk (posture) . . . Be kind to animals? (animal experimentation) . . . "Just another accident" (murder by automobile) . . . Syphilis . . . Safety and sanitation news pictures . . . Live with your heart—and like it! . . . Suggested activities for persons with impaired health or physical handicaps . . . Miss Fanny's tea room (play) . . . The milky way (pictures) . . . The doctor in France . . . Death to disease (the U. S. Public Health Service) . . . Traps and contraptions for the gullible (freak patients) . . . Nature's G-men (nature's forces for health) . . . Moral codes and health habits . . . Pierre Paul Emile Roux (France, 1853–1933) "who banished death from diphtheria" . . . Physical treatment of arthritis . . . The neighbors lend a hand (in home hygiene) . . . Every mural has a moral (picturing a health exhibit in which every letter is a capital letter) . . . Questions and answers . . . New books on health.

In "School and Health" conducted by J. Mace Andress, 67 Clyde St., Newtonville, Mass.:

The challenge of leisure in adolescent education . . . Accident facts and safety teaching . . . The choosing of Byrd's crew (teaching material) . . . Planning a unit on sleep and rest (Syracuse) . . .

For Junior and Senior High Schools—"Preventing Tuberculosis" is a teaching unit for junior and senior high schools. Published by National Tuberculosis Association, and available through all state tuberculosis associations.

"To the Teacher" says:

This unit is offered by the National Tuberculosis Association in answer to a country-wide demand from state and local tuberculosis organizations for teaching material to be used in schools to prepare pupils psychologically for the tuberculin test. It is believed that such a teaching plan will increase parents' coöperation and at the same time give pupils a sound educational background which will guard against fear of tuberculosis and an overly "health conscious" attitude.

There are two series of multiple choice tests, for junior and for senior high schools, of which this is a sample:

Tuberculosis is a disease which is most common among:

—small children
—young people (correct)
—older people

The study material is offered as 5 problems or questions, under each of which are suggested "activities," and "basic subject matter for the teacher."

What Are They? Are They Different?—We use quite freely whatever title or phrase catches the public fancy, or our own idea of something new or different. For some words almost any

meaning may go. The original use is elastic and may be applied widely. Other terms have certain technical, or at least specific meanings. It seems a pity to distort them, particularly when we may bring confusion to some minds.

We have conferences, study groups, institutes, seminars. Are they different words for the same meaning? We think not. We think that each should be respected for its own meaning and its own specific use. "Seminar" comes to us with a rich background of what we should have at times in our study of health education. But have we yet brought together a group which might rightly claim seminar status? May we look forward to its use in the old, university sense? In the meantime should we not avoid "seminar" when there is no seminar?

DATES AHEAD

April 24-May 1: Boys' and Girls' Week

April 25-May 2: Better Homes Week

May 1: Moving Day (health elements to look for)

May 1: May Day–Child Health Day

May 9: Mothers' Day. Better than flowers for mothers are adequate health and maternal care. See Maternity Center Assn., 1 E. 57th St., New York, N. Y., for plans and materials.

May 12: National Hospital Day. See "National Hospital Day," by A. G. Hahn. *Hospitals,* 18 E. Division St., Chicago, Ill. March, 1937. Includes proclamation for the mayor; paragraphs for radio announcers; and list of state chairmen who will welcome coöperation.

May 12: Birthday of Florence Nightingale

May 21: First Red Cross Society in U. S. Started in 1881

Suggestions for use of above dates will be found in *News Almanac for Social Work* and *Almanac for Social Work.* Community Chests & Councils, 155 E. 44th St., New York, N. Y. *60 cents.*

In April, Junior Red Cross members are scheduled to learn Red Cross water safety rules, to help provide safeguards for swimming pools, to form first aid teams, to learn precautions against food poisoning, etc.

The dates for general observance of National Negro Health Week are now past, but the celebration will come later in many communities. For plans and materials write to National Negro Health Week Committee, U. S. Public Health Service, Washington, D. C. Also ask for *National Negro Health News,* issued quarterly through the year.

"Enlistment Week," is past for the Women's Field Army of American Society for the Control of Cancer, but the Army continues its activities. For details address the Society, at 1250 6th Ave., New York, N. Y.

EDUCATION—TECHNIC

The Health Officer, U. S. Public Health Service, Washington, D. C., for Feb., 1937, includes:

National conferences on college hygiene . . . Public health education in a county health unit (Nez Perce, Idaho) . . . Detroit fights tuberculosis . . . Some techniques in the national health education of the adolescent (C. Ward Crampton) . . . What's wrong with health education . . . Book reviews (see "Educational Paths to Virtue," and "Mother and Baby Care in Pictures") . . . News briefs (includes health education paragraphs).

If you wish to see how a high school poster contest is handled write to Henry Street Visiting Nurse Service, 99 Park Ave., New York, N. Y.

"Now it can be shown" is an 8 page pamphlet illustrating the Vienna type of pictorial graphics as produced

by *Pictorial Statistics,* 22 E. 40th St., New York, N. Y. *Free.*

"Organizing a Regional Conference on Social Hygiene," by J. A. Goldberg. *Journal of Social Hygiene,* 50 W. 50th St., New York, N. Y. Oct., 1936. *35 cents.* How it was done in New York City, but is likely to point the way for other communities. In same issue are programs of kindred extensive conferences held in St. Louis, Buffalo, and Syracuse.

"Social Work Interpretation," by M. S. Routzahn. Russell Sage Foundation, 130 E. 22d St., New York, N. Y. *10 cents.* The latest bibliography covering such topics, as, Public opinion . . . The newspaper . . . Writing . . . Radio . . . Meetings and speaking. Broadly related to social work, with specific references to health material, and much application possible to health education.

Ten of 48 pages in "Cooperatives" are pictographs. This pamphlet is an effective example of presenting the main arguments pictorially, supplemented by clearly written text. Paper, *25 cents;* boards, *35 cents.* Foreign Policy Assn., 8 W. 40th St., New York, N. Y.

To understand health education work among young women and the Y.W.C.A., you may wish to look up articles in *Womans Press,* 600 Lexington Ave., New York, N. Y. *20 cents.* In the March, 1937, issue: "The Health Education Secretary as a Group Worker," "Health Educator — Her Majors and Minors."

HEALTH EDUCATION

Health Education Outlined — Every 2 years the *Social Work Year Book* (Russell Sage Foundation, 130 E. 22d St., New York, N. Y.) seeks to interpret all of the forms of social and health work, and related interests, to the professional and volunteer workers in the varied fields of interest.

The adult or popular health education article in the 1937 edition was prepared by Raymond S. Patterson. Here is Part I of the article:

Health Education, in its broadest sense, is the sum of all experiences which influence habits, attitudes, and knowledge relating to individual and community health. For the purposes of this article, however, the term is limited to such activities as are deliberately directed toward these objectives. This usage does not imply that health education is an administrative entity; on the contrary, it connotes a broad program in which all health workers are expected to take an active and intelligent part. Almost every contact of health officials and voluntary health workers with individuals or groups of people present opportunities for health education. Although completely staffed health agencies employ specialists to plan and administer the educational program, that program fails of its widest usefulness unless all staff members participate in it. For a discussion of health education as related to school children, *see* School Health Work.

The work of the health educator includes some or all of the following activities: (a) enhancing the educational values of public clinics and other public health services; (b) interviewing individuals and arranging group meetings; (c) preparing, or obtaining from other sources, educational media supplementary to personal interviews and group meetings.

These media include news items, bulletins, booklets, radio talks, movies, and exhibits. An effective program of individual instruction, group contacts, and general propaganda calls for a succession of timely projects formalized in a campaign calendar.

Participating Agencies

Health education is now acknowledged to be an integral part of any official or governmental health program. What was in the past considered largely the province of the private health agency is now accepted as a public responsibility. Leaders in public hygiene now agree that some official health worker should assume the central rôle in formulating and administering the community's health educational program. Whether the public health officer himself, or a public health nurse, or a health educator undertakes this task depends upon community resources. Formation of health educational councils are favored in which representatives of the city health de-

partment and other social agencies may meet to formulate a common program to correlate the educational work of all. Variations of the health council plan are found in associations of outpatient departments, divisions of councils of social agencies, and the like. Whatever the form, the trend is definitely toward effective coöperation of official and voluntary educational efforts. *See* Public Health Agencies, Voluntary.

Local public agencies are frequently assisted in their educational programs by state health and welfare departments. Administrative practice in this respect is uneven; in some states the educational divisions of the state departments have made outstanding contributions, while in others little has been done. A notable achievement in this area is the radio "health play" program of the New York State Department of Health. A continuing series of radio plays is being written, directed, acted, and transcribed by members of the department; these plays are given over a local radio station, where electrical transcriptions are produced for distribution to other broadcasting stations; and later these records are offered to local health workers in much the same manner as are motion pictures. Limitations of space prevent the description of pioneering efforts of other states, though many are noteworthy.

The outstanding development in official participation in health education was the formation in 1936 of the Office of Public Health Education in the United States Public Health Service. The functions of this new office, in addition to the education of professional workers, include research in educational methods, experiments in mass education, and the preparation of educational material. Under the provisions of the federal Social Security Act, other departments of the national government—notably the Children's Bureau—are augmenting or devedoping similar services. *See* Public Health Organization, Governmental.

Health education more than any other health service requires the effective coöperation of voluntary organizations with official agencies, both locally and nationally. Each year sees a closer coördination between the official agencies and the nonofficial groups. Among the voluntary agencies themselves many local and state medical societies have appointed committees to further the participation of the medical profession in public health. Some of these committees have full-time professional staffs, carrying on ambitious educational projects. The Bureau of Health and Public Instruction of the American Medical Association has grown markedly, and in addition to assisting local and state medical associations, carries on independently a nation-wide program of radio broadcasts. Such effective participation of organized medicine in health education is of inestimable value to public hygiene.

The public health nurse who visits the sick in their homes, attends public clinics, or meets groups of adults, has perhaps the one best opportunity to influence the health habits, attitudes, and knowledge of individuals. That the public health nurse may make fullest use of this opportunity to serve as health educator is one of the aims of the National Organization for Public Health Nursing. *See* Public Health Nursing. Tuberculosis associations—local, state, and national—have been pioneers in health education, and enjoy an enviable record of coöperation with official and with other voluntary health organizations. As public agencies extend their provisions for finding and caring for tuberculous patients, the tuberculosis associations are enabled to concentrate their funds and efforts on direct health education. The ever-expanding educational program of the National Tuberculosis Association now includes pioneering projects in the field of health exhibits, in which a renewed interest is being taken by many agencies. *See* Tuberculosis. The educational programs of other national health agencies have also shown a healthy expansion, and still other agencies, though concerned primarily with fields apart from health education, contribute to it. An outstanding example of the latter is the American Red Cross whose instructional projects in home hygiene, first-aid, nutrition, pellagra control, and the like, are essentially contributions to health education. The National Health Council's recent "town meeting" program was a joint effort of voluntary health agencies to stimulate official bodies to interest influential citizens in improving public health. The project was undertaken in 50 or more municipalities with varying degrees of success, reflecting the enthusiasm and effort of the local leaders.

Though commercial organizations have much to contribute to the field of health education, their entrance into it presents problems to the health educator. They produce excellent educational material, but the possibility of their offering thinly veiled propaganda, masquerading as education, is one against which the health administrator must guard.

Health Education in Illinois—The Department of Public Health, State of Illinois, for 1935–1936, gives 3 pages to Division of Public Health Instruction, B. K. Richardson, Chief. The opening paragraph says:

> The editing and publication of an attractive booklet on infant care which has proved to be exceedingly popular, the compilation and publication of two special statistical bulletins that relate in detail to fundamental health problems in the political units of the state, the promotion of Town Hall meetings on health in 8 municipalities, the management of the annual conference of Illinois health officers and public health nurses and the development and execution of plans for exhibits displayed at the State Fair, State Medical Society meeting and at other places are among the principal extra-routine features of work undertaken and accomplished by the division during the year The routine activities include the publication of the bi-weekly bulletin of the department, *Illinois Health Messenger*, each issue of which reaches 25,000 people, the preparation of copy for the press, the preparation and release of a weekly and bi-weekly statistical bulletin for public health workers, the management of radio programs over 4 stations, the editing and publication of the annual report of the department, the preparation of special articles for various public health and medical journals, and the editing and publication of literature prepared for general distribution by the department.

The Division of Sanitary Engineering needs a page, under 3 sub-heads, to tell of its educational work.

Vital statistics tells of an exhibit at the State Fair.

Division of Dental Health Education has nearly 2 pages.

Division of Child Hygiene and Public Health Nursing, which "is basically educational in character," has 3½ pages.

Notwithstanding the above record of extensive health educational activity, the showing in the index is limited to—

Health education	9, 11
Health Messenger	12

Elsewhere are references under Dental health education: Educational work (sanitary engineering division); Public health instruction; Radio broadcasting programs; and Town Hall meetings.

How much better for the student and research worker, and public health educator, if all references had been included under health education!

Health Education in Public Health—Not all of the books which review the whole of present-day public health include a recognition of public health education as an accepted phase of public health administration or public health activity. In *An Introduction to Public Health*, by Harry S. Mustard of Johns Hopkins University, we do find that recognition.

Under "Organization and Administration" we find 2 pages in which health education, its possible audiences, and methods of approach are described. There are some practical suggestions, positive and negative.

There is nearly a page outlining "What the general public should be taught about tuberculosis," and ½ page outlining "what the public should be taught about cancer." The index reference to health education on page 163 is a mistake. Published by Macmillan Company, 60 5th Ave., New York, N. Y. *$2.50.*

HEALTH PERIODICALS

Cleanliness seems to have fared better in England during the depression than in the United States. The *Occasional Bulletin* of Health and Cleanliness Council has from time to time indicated numerous and varied activities without apparent let-up during many years. Printed matter, dramatic material, and graphic devices are offered by the Council at 5, Tavistock Square. London, W. C. 1.

Everybody's Health, 11 W. Summit Ave., St. Paul, Minn. The November, 1936. number was a "10th Annual

Milk Issue," with large size pictures and text. *10 cents.*

The industrious collection of opinion and news relating to one phase of public health administration is illustrated by the contents of *Health Officers News Digest,* Public Health Committee of the Cup and Container Institute, 30 Rockefeller Plaza, New York, N. Y.

National Health Review, Ottawa, Ontario. Oct., 1936. Devoted wholly to a report of Sub-committee on Nutrition of the Canadian Preparatory Committee, British Commonwealth Scientific Conference.

Neighborhood Health, New York City Dept. of Health, for March, 1937, is a nutrition issue. "On Guard!" tells how the Department guards the food supply. "You have received information about food and nutrition at the Health Centers of the Department of Health. Has this information helped you?" Seven housewives answer, a small photograph of each is shown—they are American Indian, Chinese, Puerto Rican, Negro, Jewish, Irish, and Czechoslovakian. Other food or nutrition material, and two sketches are included.

Of the bulletins or house organs intended for the local workers the newsiest and most informative which reaches us is probably *Flashes,* issued by the Tuberculosis and Public Health Committee, State Charities Aid Association, 105 E. 22d St., New York, N. Y. In honor of this special event, for just this once, we mention the full name of the organization. The cover is printed, with date, number of issue, and main contents mimeographed. The cover sheet is double letter size, so that the mimeographed text pages are slipped inside and then stapled. The editor is Marie Warner Anderson; the artist, Mae E. Moran.

Public Health News, State Dept. of Health, Trenton, N. J., is now issued bi-monthly.

MAGAZINES

"Are We a Nation of Prudes?" Page editorial. *Collier's.* Feb. 6, 1937.

Today we talk frankly enough about many intimate personal problems which would have shocked our grandparents. Although we are a sophisticated people, when it comes to a question like syphilis, we are still a nation of prudes.

"Foot Notes for the Family Feet." What happens as the "average" American "trudges through life for a total of 65,000 miles." *Literary Digest,* 354 4th Ave., New York, N. Y. Feb. 27, 1937. *10 cents.*

"The Forgotten Family Remembered," by I. M. Havey. *Red Cross Courier,* Washington, D. C., Feb., 1937. *10 cents.* Starts with the incredible picture of hospital nursing before Bellevue began training nurses, and traces the steps in the development of Red Cross nursing services.

"Germ-killing Lamp Preserves Food: Mold eliminated, meat tenderized by ultra-violet death rays." *Literary Digest.* March 6, 1937. *10 cents.*

"Here's Looking through You," by H. Lees. *Collier's.* Feb. 20, 1937. "Nowadays, at the slightest provocation, an X-ray specialist will take pictures of brain, gall bladder, or a lung."

In *Reader's Digest,* Pleasantville, N. Y. (March, 1937: *25 cents*): "Where Do We Get Our Prejudices" (from *Harper's*); "Combating Early Syphilis"; "It's Safer to Go to Work"; "Hospital Hospitality" (which may suggest to some readers how clinics, health department entrance offices, etc., may be made more "hospitable"); "Mother Nature Knows Best" (*Virginia Quarterly Review*), animal health practices.

"Protective Foods for the Family," by M. H. Irwin. *National Parent-Teacher,* 1201 16th St., N. W., Washington, D. C. March, 1937. *15 cents.*

"Purity Preferred," by V. G. Heiser,

M.D. *Collier's.* March 13, 1937. Why a health department, and what it does.

"Stop This Slaughter"; "Reckless Drivers"; "The Cost of Being Careless"; "Drive Slow!!!"; "These Children Are Too Young to Die"; "Stop, Look and Live"; "Be Smart and Live." Seven pages of safety pictures, plus 2 pages of child labor pictures. The newest picture magazine, *Look,* Des Moines, Iowa. April, 1937. *10 cents.*

"U. S. Science Wars against an Unknown Enemy: Cancer"; 8 pages in *Life,* 350 E. 22d St., Chicago, Ill. March 1, 1937. *10 cents.*

"Victor Heiser, M.D." An interview and a portrait in *Junior League Magazine,* 305 Park Ave., New York, N. Y. March, 1937. *30 cents.* Here is how his book was written:

> How could anyone turn out a thousand-page best seller, dealing with public health in 45 countries, in a month, we asked? Actually, he said, the material for the book was gathered over a period of 20 years.
>
> "You see," he explained, "when I was a very young doctor in the young field of public health, I traveled in many out-of-the-way places. I love a good story, and I picked up a number of unusual ones which I used to tell my friends. They advised me to keep a written record of my experiences, so I began noting them down in a diary. After I retired as director of the International Health Division of Rockefeller Foundation 2 years ago, my friends urged me to publish my experiences, and I actually started the book. Fortunately I found just the right person to sit behind a screen in my study and take down verbatim the tales I told my friends. At the end of the day, the stories which had been taken down were checked with my diary for actual dates and chronological order. It was very satisfying to me to read one reviewer's opinion of my book in which he said that reading it was like listening to a series of fireside chats; because that is exactly how the book was written."

"Who Taught You to Drive?," by T. R. Carskadon. *Collier's.* March 6, 1937. Millions really don't know how to drive the car they handle; a one man campaign for better drivers.

MOTION PICTURES

"Further Experience in Movie Making," by E. G. Sargent. *Public Health Nursing,* 50 W. 50th St., New York N. Y. Oct., 1936. Another in a series of articles on movie making by nursing groups. In this case a low cost professional photographer was employed. The scenes are described. Reprint of the series, *15 cents.*

The Journal of Social Hygiene reports a new French film on gonorrhea.

More than 200 copies of "Behind the Shadows" were sold in 4 months.

Movie Makers (420 Lexington Ave., New York, N. Y.) notes that

> A complete training course in the duties of a midwife is one of the subjects most recently treated in 16mm. film by Dr. G. H. Gunn, medical health officer of the Public Health Department of Durban, South Africa. He reports that this film has been of the greatest use in teaching practical methods to uncertificated, non-European midwives, mainly Asiatics, who serve the large Indian population of Durban. It is the department's intention to add sound on the film to this picture in the near future. Other subjects produced under Dr. Gunn's direction, with Lynn Acutt handling the photography, have been films on anti-plague sanitation, anti-mosquito sanitation, milk supply, water supply, town cleansing and health culture.

The Sacramento Tuberculosis Assn., as reported in *News Letter* (Calif. Tuberculosis Assn., 45 2d St., San Francisco) has made—

> An interesting 16mm. silent film of the tuberculin testing survey of the Senior High School. Used before clubs and other groups. The film is winning greater interest and enthusiasm for surveys throughout the county. The picture, entitled "The Value of Tuberculin Testing," is enlivened with a story which is carried through the film. If you should consider producing a film picturing the work of your association, we suggest you write Estella S. Edson, Executive Secretary, and get from her the details of her experience in this line.

"Selected Motion Pictures: 1936–1937" lists some health pictures available through the Motion Picture Bureau, National Council Y.M.C.A., in New York, Chicago, and Portland, Ore. Get list from 347 Madison Ave., New York, N. Y.

School Movie Making—A Brooklyn school has illustrated the idea this department has been urging — that schools be enlisted in health movie making. *Bulletin* of National Tuberculosis Assn. (Feb., 1937) tells the story, and raises a question at the end of this quotation:

An ambitious biology club of a Brooklyn school is working on an amateur movie based on Trudeau's Autobiography. This is an admirable undertaking, valuable not only to interest young people in tuberculosis, but also later to instruct many others. Are there not movie enthusiasts in your community who might be inspired to photograph a story based on points of local interest or on some outstanding personality who has contributed to the movement? Is there, perhaps, a recovered patient in your town whose experiences could be narrated on celluloid? Amateur movie making is a fine class project calling for integration of history, biology, art, dramatic, and English courses. Of course such a project must be ably led. Making a movie is not child's play. Would you be interested in an amateur movie league specializing in health pictures? If so, write the Health Education Service.

PROFESSIONAL TRAINING

"Suggestions for a Staff Program for the Study of Maternal Welfare." One of a series. *Public Health Nursing,* 50 W. 50th St., New York, N. Y. Feb., 1937. *35 cents.*

Institute for Tuberculosis Workers, June 14–26, 1937, University of Southern California, Los Angeles, Philip P. Jacobs, conductor. Address a state tuberculosis association, or the conductor in care of National Tuberculosis Assn., 50 W. 50th St., New York, N. Y. Will include educational methods and child health education.

A Summer Course in Public Health Education—The Rutgers University course in 1936, led by C. K. Blanchard, 6 hours:

A. Content of health education; what to teach in personal hygiene and community sanitation and hygiene; pedagogical methods.
B. Verbal instruction of groups and individuals; principles of public speaking.
 Exercise—preparation of lecture outline.
C. Informational pamphlets; what to include; methods of preparation, distribution of printed matter.
 Exercise—preparation of sample leaflet.
D. Bulletins and reports; what to include, preparation and distribution; study of sample periodicals.
E. Newspaper informational publicity; what is news, how to prepare material, how to get matter printed.

RADIO

The National Tuberculosis Association is planning the production of electrical radio transcriptions.

Public Health News, New Jersey Department of Health, Trenton, reports on radio activity:

The Hudson County Board of Health and Vital Statistics conducts the "Radio Health Forum" in Jersey City. According to the fan letters received, the radio is an excellent medium of spreading health measures.

The Hudson County Medical Society also recently established a broadcast patterned after the "Radio Health Forum."

The program of presentation consists of a few introductory remarks by the program conductor and then a talk of from 8 to 9 minutes by some person interested in health promotion on some phase of a condition or disease to which humans are susceptible. There have been many interesting talks given on personal and public health. In addition to the regular talks, immunization against diphtheria for all children has been stressed, and several skits have been dramatized, demonstrating health activities.

If any department of health in the state desires service or assistance to arrange the inauguration of similar health broadcasts please write to Hudson County Board of Health and Vital Statistics, Harry F. Downes, Statistician and Radio Director.

"Radio Broadcasting Bibliography"

(to Jan., 1937). Titles are grouped under "General"; "Broadcasting Technique"; "Foreign Broadcasting"; "Publications of CBS"; "Publications of NBC"; etc. *Free* of Columbia Broadcasting System, 485 Madison Ave., New York, N. Y.

"Radio Forum on Growth and Development of the Child" is conducted under the joint auspices of the National Congress of Parents and Teachers, the American Academy of Pediatrics, and the National Broadcasting Co. For announcement of the series starting last October, write to N.B.C., 30 Rockefeller Plaza, New York, N. Y. Given Wednesdays, 4:00 to 4:30 p. m., E.S.T., over Blue Network of NBC. The closing sessions will be as follows:

April 14: "Disease and the Doctor's Side of Growth," by Joseph Brennemann, Chief of Staff, Children's Memorial Hospital, Chicago, Ill.

April 21: "The Effects of Family Income on a Child's Growth," by Martha M. Eliot, Assistant Chief, Children's Bureau, U. S. Department of Labor.

April 28: "The Effect of Child Labor on Growth," by Richard A. Bolt, Director, Cleveland Child Health Assn.; Lecturer, University of California.

May 5: "Growth of Children During Wars and Depressions," by Carroll E. Palmer, Medical Officer in Charge of Child Hygiene Investigations, U. S. Public Health Service.

May 12: "Health Hazards in the Period of Growth," by Louis I. Dublin, Vice-President and Statistician, Metropolitan Life Insurance Company.

May 19: "Old and New Thoughts About Growth," by Henry E. Sigerist, Professor of History of Medicine, Johns Hopkins University School of Medicine.

To insure the local broadcast of a network program health agencies should announce the program to local groups interested in the subject matter. The local stations are far more likely to broadcast the program if these local groups urge the stations to do so. Be sure to get into action as early as possible. There have been keen disappointments when local broadcasts have been taken for granted, and local groups failed to express their interest in advance.

You Can't Get Time On the Air?—What health department or other health agency cannot get time through a local broadcasting station? Or, cannot get time at an hour which seems worth the effort demanded by a good job of broadcasting?

The facts as to lack of opportunities may clarify discussion of the subject.

As Members of Radio Audiences—Time and again representatives of broadcasting companies emphasize their responsiveness to their audiences.

This fact seems to point to activity in getting listeners to register their approval or disapproval of health broadcasts. Health workers first, as radio listeners. Then follow with club discussions and requests for letters or postal cards, and for resolutions, too. Results depend upon how much we and others are truly interested in health broadcasting.

REFERENCE—EDUCATION

"About Tuberculosis." John Hancock Mutual Life Insurance Co., Boston, Mass. *Free.* Cover and 16 pages.

"Avoid Influenza: If You See a Fellow with a Cold, Run, or Your Nose Will Run Later." State Dept. of Health, Hartford, Conn. One page. How to protect yourself; how to protect others.

"Combating Early Syphilis," by Dr. J. H. Stokes, is another *Reader's Digest* venture. In March, 1937, issue; 6 pages; reprints, *$1.00* a hundred. Address: Pleasantville, N. Y. A foreword by Dr. Parran says:

Dr. Stokes' contribution contains information that is absolutely essential to the success of our campaign; a thoughtful reading of

the article should enable the layman to understand what can and must be done by the private physician and his patient in controlling the disease.

"Common Colds." State Dept. of Public Health, Springfield, Ill. Symptoms, causes, control.

"A Directory of Organizations in the Field of Public Administration—1936" (Public Administration Clearing House, 850 E. 58th St., Chicago, Ill. 180 pages. $1.00) is a source of information for many who write and plan. It includes a list of national organizations; classification of the nationals by fields of activity; state, regional, and Canadian organizations. For the executive, the health educator, and other staff members.

"The Doctor of Tomorrow," by Dwight Anderson. Reprint. Medical Society of State of New York, 2 E. 103d St., New York, N. Y. *Free.* A presentation of the idea that a doctor will serve the people even though the state sets conditions which make it difficult for him to do so.

"The Expectant Mother" is a new 10 page folder on maternal care issued by U. S. Children's Bureau, Washington, D. C. Single copies *free.*

"Handbook on the Nursing Care of Pneumonia," and "Suggestions to the Family for the Home Care of a Pneumonia Patient" (stiff paper folder). State Dept. of Health, Albany, N. Y.

"Home Care of Communicable Diseases." John Hancock Mutual Life Insurance Co., Boston, Mass. *Free.* With a double page chart showing time exposure to first sign, early signs, time to observe exposed children, and so on.

"Our Nurses." A 28 page pamphlet issued by Advisory Committee on Nursing, Room 210, 105 E. 22d St., New York, N. Y. On left-hand pages: a description of a service, with several paragraphs indicating the present status or extent of the service, including prenatal, infant welfare, preschool, school, etc. On the right-hand page: a case story; "Babies Welcome," "Jimmy Lasky," "Marie Antonini," etc.

"Pertinent Facts About Syphilis." State Dept. of Public Health, Springfield, Ill. Mimeographed.

A series of short articles on measles and scarlet fever are offered by the "Health Reporter" of Health News Service, 22 E. 40th St., New York, N. Y.

"State and Local Social Hygiene Societies in the United States"; National agencies with departments, committees, etc., concerned with social hygiene; United States official agencies having to do with social hygiene. Lists in *Journal of Social Hygiene,* 50 W. 50th St., New York, N. Y. Oct., 1936. *35 cents.*

The study program for board and committee members continues through issues of *Public Health Nursing,* 50 W. 50th St., New York, N. Y. In Dec., 1936, were outlines on U. S. Public Health Service, U. S. Children's Bureau, and Office of Indian Affairs.

"A Summer Camp for Diabetic Children." Much detail as to the condition of the children as well as camp management; forms; recommendations for the future. New York Diabetes Assn., 386 4th Ave., New York, N. Y. *Free.*

The U. S. Public Health Service has announced that proceedings of the First National Conference on Venereal Disease Control Work has been published as Supplement No. 3 to *Venereal Disease Information,* Supt. of Documents, Washington, D. C. 154 pages. *15 cents.*

"Waistlines," by Dr. W. W. Bauer. An overweight pamphlet of 20 pages. "Nature seems to have decreed that longer life lines shall go with shorter waistlines"; and what to do about it. John Hancock Life Insurance Co., Boston, Mass. *Free.*

"Watch Your Diet," by E. M. Geraghty. American Medical Assn., 535 N. Dearborn St., Chicago, Ill. *10 cents.* "For those whose weight is normal."

Reprints from Children's Bureau, Washington, D. C.:

A Study of 244 Prematurely Born Infants . . . Progress in Maternal and Child Welfare Under the Social Security Act . . . Public Health Nursing in Programs for Crippled Children . . . A Statistical Study of Stillbirths in Hospitals . . . The Trend of Child Labor in 1936 . . . a group of articles on Social Security Services for Mothers and Children.

From Committee on Tuberculosis and Public Health, SCAA, 105 E. 22d St., New York, N. Y.:

Putting Our Knowledge of Tuberculosis to Work Through the Public Health Agencies, by Homer Folks (*Free*) . . . Continuity and Growth of the State Department of Health, by Homer Folks (*4 cents*) . . . The Modern Background of Syphilis Control, by Dr. J. E. Moore (*3 cents*) . . . Routing Tuberculosis from Its Last Strongholds Among Workers, by Amberson, Greenberg, and Winslow (*10 cents*).

Reprints from *Public Health Nursing,* 50 W. 50th St., New York, N. Y., at *10 cents* each:

Industrial Nursing Pays . . . The Nurse in Pneumonia Control . . . Nurse-Teacher Rapport . . . The School in a Community Health Council . . . Volunteers for Mothers' Clubs.

Study Program for Board and Committee Members: The U. S. Public Health Service . . . The N.O.P.H.N.

Programs for Staff Education: Maternal Welfare

SAFETY

If your responsibilities or opportunities touch mining regions you will wish to receive *New Publications,* U. S. Bureau of Mines, Washington, D. C. *Free.*

"Reducing Fire Accidents in Homes," by T. A. Fleming. *National Parent-Teacher Magazine,* 1201 16th St., N. W., Washington, D. C. Aug., 1936. *15 cents.*

"Safety in Pupil Transportation." Equipment, drivers, tests, etc., etc. *Research Bulletin,* National Education Assn., 1201 16th St., N. W., Washington, D. C. Nov., 1936. *25 cents.*

"Falls and How to Take Them," by C. L. Bryant. *Red Cross Courier,* Washington, D. C. Jan., 1937. *Free.*

"A Hunt for Hazards in the Home," by A. W. Knight. *Red Cross Courier.* Dec., 1936. School children seek accident causes.

"Policing the Medicine Cabinet," by B. France, tells how to avoid unsafe practices in the home collection of medicines and emergency materials: "The How, What, When, and Why of School Children's Accidents," by J. M. Pinckney, analyzes such accidents, and includes an outline of a boy's body with figures on accidents by parts of the body. A useful device for reaching adults as well. In *Safety Education,* 1 Park Ave., New York, N. Y. Jan., 1937. *10 cents.*

"Safeguarding the Eyes of Children: a Pictorial Review." *Sight-Saving Review,* 50 W. 50th St., New York, N. Y. Sept., 1936. *50 cents.* One of a series of pictorial presentations.

"The Safe Way All Day," by C. Towle. *Safety Education.* March, 1937. A children's pantomime in 5 scenes. A desirable element in this outline is that the main idea only need be stated, and then the children may work out the detailed action.

"Sight Conservation as an Educational Problem," by R. S. French. *Sight-Saving Review.* Sept., 1936. *50 cents.* "More than ever, educators are using motion pictures, slides and other visual aids in carrying out their work. This trend alone necessitates an added interest in a school eye health program."

"You Bet Your Life! A Review

of America's Shameful Automobile Accident Record." Travelers Insurance Co., Hartford, Conn. *Free.* The seventh in a series of annual publications, each a scrapbook of statistics, cartoons, and striking illustration. In the 1937 edition the hazards of traffic are compared with some forms of gambling.

"Fun with Facts" is a 32 page booklet setting up a number of simple, but interesting experiments and entertaining problems. These give opportunities for testing personal reactions, and to observe the workings of certain physical laws. All of the answers are tied to automobile accident possibilities. Try them on young people and adults. Travelers Insurance Co., Hartford, Conn. *Free.* There is material for illustrated talks before Rotary and other audiences. Teachers, club leaders, scout masters, and others should be able to make good use of this material.

PLAYS AND PUPPETS

"Exit the Monster," by A. C. Gilmore. American Medical Assn., 535 N. Dearborn St., Chicago, Ill. *10 cents.* A play for children and adults, introduces Edward Jenner.

"Health Plays for School Use." School Health Education Service, 1201 16th St., N. W., Washington, D. C. Revised. *Free.* List of play sources, references on technic of production; and a foreword, which follows, which should be quoted widely by those who are dealing with teachers:

> Dramatic expression is so congenial to children that it is natural for the teacher to have faith in a lesson cast in such a form.
>
> It is important that the lesson in play form be not only truly imaginative, but also that its factual content ring true, and that the action have, inherent in it, real dramatic possibilities. In selecting the health plays here listed, an effort has been made to choose those most naturally childlike, most naturally dramatic.
>
> Teachers should remember, however, that the richest vein of dramatic possibilities for learning always lies in the child himself—especially in the little child. His original dramatic expression, in words and action, of an idea that is clearly presented to him and that has become thoroughly familiar, will always have greater educational value than any dramatic activity prearranged for him.

"How to Make and Operate Marionette and Puppet Shows," by M. Wagner. A. S. Boyle Co., 1934 Dana Ave., Cincinnati, Ohio. *Free.* In 28 pages, with numerous illustrations, are practically complete instructions for building a puppet show. In this case puppets are made from plastic wood.

"Looking Back," public health nursing of 25 years ago, and "Then—and Now," the nurse in a milk dispensary of the same period. Two plays for adult audiences. National Organization for Public Health Nursing, 50 W. 50th St., New York, N. Y. *3 cents.*

"Puppetry Bulletin: 1936–1937," by Paul McPharlin, Birmingham, Mich. *Free.* A source of information as to new publications and new materials for those who use puppets for teaching or just for fun.

Capital Letters Are Hard to Read—Long ago advertising psychologists tested and proved that capital letters are hard to read. In other words, every letter capitalized in the word or sentence to emphasize its importance actually reduces its legibility.

The other day we saw two striking displays put up by a health department. All letters were capital letters. All capital letters were hard to read.

Most road signs are in all caps—and so they are harder to read than if lower case were used. Make lower case letters as large as the caps, and they will be as easily seen, and more easily read.

BOOKS AND REPORTS

Books of Special Interest to Public Health Workers

MAZŸCK P. RAVENEL, M.D.

OUR review of books on public health presented last year was received with sufficient enthusiasm by our readers to warrant repeating the survey this year.

The following recommendations and comments upon books published during 1936 are based chiefly on reviews in our *Journal*. The *British Medical Journal, The Lancet,* the *Journal of the American Medical Association,* and other magazines have been consulted; but it must be borne in mind that we avoid books on clinical subjects because our primary interest is public health.

HOUSING AND NUTRITION

APART from what might be called local manifestations of disease, such as poliomyelitis, in several of our states, we believe that housing and nutrition have attracted more attention than other branches of public health. As regards foods, there have been many papers on the subject, but few good books have come to us, and of those some have been of the nature of propaganda rather than substantial works. We except, of course, some of the standard books which have come out in new editions, and are still our best guides. A useful book for reference is *Foods and Beverage Analyses,* by Milton A. Bridges, Lea and Febiger. This gives the mineral content of more than 440 foods and tables showing the iodine content. A large part of the book is devoted to vitamins. It ends with an extensive bibliography running up to July, 1935. A second book, which is propaganda and contains a great deal that is useful, though put in a way which is not entirely pleasing to the scientific man, is *American Chamber of Horrors,* by Ruth deForest Lamb, Farrar and Rinehart, in which the Food and Drug Administration took some part. *The Problem of Nutrition, Vol. I,* Interim Report of the Mixed Committee on the Problem of Nutrition, should be mentioned here as an excellent review of the principles of nutrition, Geneva, 1936, League of Nations, Distributed by World Peace Foundation.

PUBLIC HEALTH NURSING

NURSING generally, and public health nursing especially, continues to attract increasing attention, and it seems safe to say that public health workers as well as administrators are recognizing more and more the importance of the public health nurse in carrying out their general program. Two substantial books have appeared. *Textbook of Attendant Nursing,* by Katherine Shepard and Charles H. Lawrence, Macmillan. The authors have had 17 years' experience in teaching. It has especial value in supporting the teaching of this branch of nursing in special schools rather than making it a by-product of schools of nursing. *Public Health Nursing,* by Mary Sewall Gardner, Macmillan, which has now reached its 3rd edition, has been from

the first the only text of its kind in the field. The new edition maintains the high standard set by its predecessors.

INDUSTRIAL MEDICINE

THE revival of industry along so many lines brings knowledge of industrial medicine to the front. *Industrial Medicine,* by W. Irving Clark and Philip Drinker, National Medical Book Company, is especially strong on the occupational diseases. It goes quite extensively into pneumonoconiosis. This condition to which much attention has been directed by the terrible experience in West Virginia and the racket of suits against employers, is further treated of in *The Pneumonokonioses (Silicosis): Literature and Laws of 1934,* by G. G. Davis, E. M. Salmonsen, and J. L. Earlywine, Chicago Medical Press. *Injury and Incapacity,* by H. Ernest Griffiths, Wood, was written with especial reference to industrial insurance, and as it is an English book, is particularly applicable to conditions in Great Britain. It is, however, considered by experts an " indispensable volume " to those interested in this subject. *Industrial Dust,* by Philip Drinker and Theodore Hatch, McGraw-Hill, is based on a bibliography rich in material, both foreign and domestic, as well as expressing the experience of two well known workers in this line The book is recommended for physicians, engineers, hygienists, nurses, teachers, and in fact all who are interested in industrial problems, as well as the general health officer.

SANITARY ENGINEERING

IT is trite to say that sanitary engineering occupies such a commanding position in public health that good books in that field are always welcome. We have to recommend *American Sewerage Practice, Vol. III, Disposal of Sewage,* by Leonard Metcalf and Harrison P. Eddy. Revised by Harrison P. Eddy, McGraw-Hill. The unfortunate death of Mr. Metcalf has left the revision of this 3rd edition to Mr. Eddy. In the 18 years which have elapsed since the 2nd edition, an enormous amount of knowledge has been gained, and incorporated in this work. The number of chapters has increased to 33, though the size of the book has been kept much the same. It will probably remain for many years, as the other editions have been, the standard. *Standard Methods for the Examination of Water and Sewage,* American Public Health Association and American Water Works Association, has reached its 8th edition. It has been greatly expanded and revised and continues to serve as the outstanding work in this field.

MENTAL HYGIENE

MENTAL hygiene has, as usual, occupied a fairly conspicuous place. *Mental Health,* by Frank E. Howard and Frederick L. Patry, Harper, is the result of the collaboration between the psychiatrist and psychologist. Since authors on mental conditions are apt to use language which is often obscure to the average reader, it is pleasing to note that this book is presented in an interesting manner and is highly practical. *The Subnormal Mind,* by Cyril Burt, Oxford University Press, is a thought-provoking volume built up on a series of lectures given by the author under the Charles Heath Clark bequest. The author breaks away from some of the old fashions, and joins McDougall and his followers. *Know Thyself: A Study in Mental Qualities,* by John Potts, Dorrance, presents in simple language and engaging style a plan for effective living. The reviewer considers it an outstanding contribution to the literature dealing with successful living. *Child Psychi-*

atry, by Leo Kanner, Thomas, has prefaces by Adolph Meyer and Edward A. Park. It is an encyclopedic treatise in this field.

HEALTH EDUCATION

THE usual number of books on health education have appeared this year. *Handbook of Health Education —A Guide for Teachers in Rural Schools,* by Ruth E. Grout, Doubleday, Doran, has been well received. This is made up largely of projects and experiments actually carried on in the schools of a rural section in New York but has much in it for adaptation to city schools.

PARASITOLOGY AND TROPICAL MEDICINE

TROPICAL medicine is much to the fore, and must continue to interest this country as a world power. Sir Leonard Rogers and Sir Oliver W. D. Megaw have issued a 2nd edition of their book, *Tropical Medicine,* published by J. & A. Churchill, Ltd. It is one of the best that we know. *Clinical Parasitology and Tropical Medicine,* by Damaso de Rivas, in collaboration with Carlos T. de Rivas, Lea and Febiger, represents an effort to produce a textbook written for students and practitioners in response to the demand for a treatise upon modern progress in tropical and parasitic diseases. We are indebted to Kenneth F. Maxcy and to the Commonwealth Fund for bringing out *The Bacteriology of Typhoid, Salmonella, and Dysentery Infections and Carrier States,* by Leon C. Havens, whose untimely death was such a loss to bacteriology and epidemiology. The text is more than a guide to the bacteriology of the group—it is a guide to clear thinking regarding the problems presented. *Manson's Tropical Diseases,* edited by Philip H. Manson-Bahr, Wood, has reached its 10th edition, and, needless to say, long ago gained its place as a standard text in tropical diseases. *The Principles of Bacteriology and Immunity,* by W. W. C. Topley and G. S. Wilson, 2nd edition, Wood, is extensively revised and bound in one volume. The chapters on immunity are unusually good. Its compendiousness, comprehensiveness, and accuracy make it an ideal book for all interested in bacteriology in its many relations. *Tissue Immunity,* by Reuben L. Kahn, Thomas, covers a broad field of interest, and the clinician can glean as much from its pages as the bacteriologist and pathologist. *Immunology,* by Noble P. Sherwood, Mosby, is an excellent book, especially for students. It gives an unusually clear presentation of a difficult subject. *Principles of Hygiene,* by Thomas A. Storey, Stanford University Press, has appeared in a revised edition. It is especially valuable in teaching the underlying bases of hygiene. *Medical Mycology: Fungous Diseases of Men and Other Mammals,* by Carroll William Dodge, Mosby, is a book of inestimable value as a reference work for the specialist or serious student of medical mycology. *The Algae and Their Life Relations,* by Josephine E. Tilden, University of Minnesota Press, is an excellent study which will be useful to many types of students—the public health engineer, for example, who is interested in the relation of the algae to public water supplies, and to stock men who are concerned with the problem of the poisoning of cattle compelled to drink water bloom algae. *A Guide to Human Parasitology for Medical Practitioners,* by D. B. Blacklock and T. Southwell, Wood, has reached its 2nd edition. It covers a lot of information in a small space. *Introduction to Human Parasitology,* by Asa C. Chandler, Wiley, has reached its 5th edition, and as always, maintains its place as an unusually useful book. The 5th edition of *Preventive Medicine,* by

Mark F. Boyd, Saunders, maintains its character as an exceedingly useful book.

GENERAL HYGIENE

IT is hard to classify many of the new books so they have been put in one group, more or less incorrectly. *Modern Home Medical Adviser: Your Health and How to Preserve It,* edited by Morris Fishbein, Doubleday, Doran, is one of those books the value of which is doubted by the reviewer. Conceding that such a book has a place in modern life, this is the best that we know of. The socialization of medicine has been much discussed for several years, and two very good books giving a bibliography on the subject have appeared: *Socialization of Medicine,* The Reference Shelf, Vol. 10 N,o. 5. Compiled by Julia E. Johnsen, H. W. Wilson Co., and *Free Medical Care, Socialized Medicine,* compiled and edited by E. C. Buehler, Noble and Noble. Somewhat along the same lines are *Security Against Sickness,* by I. S. Falk, Doubleday Doran, which is a good presentation of the current controversy over the Social Security issue, and *Cash Relief,* by Joanna C. Colcord, Russell Sage Foundation, which is a contribution in the field of social work rather than medicine. Two excellent books which deserve especial recommendation as being pioneers in their line are *Public Health Administration in the United States,* by Wilson G. Smillie, Macmillan, and *Introduction to Public Health,* by Harry S. Mustard, Macmillan. Dr. Smillie as a professor and Dr. Mustard as an administrator have both had extensive experience in the fields of which they write, and both books can be thoroughly recommended.

In view of the great attention which is being given by engineers to air conditioning, it is surprising that so few books on the subject have come to our desk. *Lewis' New Air Conditioning for Comfort,* by Samuel R. Lewis, Keeney Publishing Co., is excellent. A very useful book published by the Commonwealth Fund, is *Lobar Pneumonia and Serum Therapy,* by Frederick T. Lord and Roderick Heffron, giving us the latest information on the various types of pneumonia and the use of the improved sera which have been developed by Dr. Felton. It describes also the methods of typing the organisms and advocates the superiority of that of Neufeld. Louis I. Dublin and Alfred J. Lotka have once again placed us in their debt in *Length of Life,* Ronald Press. It should be read by everyone interested in public health or demography. While somewhat abstruse and very technical, it is presented in language which the reader of average intelligence can understand.

A book of unusual value appeared about the middle of the year, *The True Physician,* by Wingate M. Johnson, Macmillan. Based on lectures given to the graduating class from Duke Medical School, it is particularly adapted to advanced students and young doctors, but may well be read by all interested in the welfare of the medical profession. *Why Keep Them Alive?* by Paul De Kruif, in collaboration with Rhea De Kruif, Harcourt, Brace, has caused a great deal of discussion. It is a popular glorification of public health activities, devoted largely to child welfare. It is frankly propaganda for taking better care of the children. It is in the usual interesting style of the author. *Health and Human Progress,* by René Sand, Macmillan, is described as a learned, interesting, and stimulating essay on social progress. The name of the author alone assures us of its value. *An American Doctor's Odyssey,* by Victor Heiser, Norton, has been a best seller. It is a thrilling story of public health work in pretty nearly every part of the world, but especially in the East. It is worth

reading as a story of success and also as one of adventure. *My Life and Work,* by Adolf Lorenz, Scribner, is an autobiography of the well known bloodless surgeon. It is an interesting story of accomplishment and success by one who started life under a great handicap.

We are indebted once again to Wu Lien-Teh for *Plague: A Manual for Medical and Public Health Workers.* It is issued by the National Quarantine Service, Shanghai, China. Dr. Wu is too well known to need an introduction. As Director of the Manchurian Plague Prevention Service, he has had an enormous experience, much of it shared by his co-authors. Among his other services he has now given to China an excellent quarantine service. *Stamp Out Syphilis!* by Thomas Parran, *Survey Graphic,* is worth calling to attention once more, although few monographs have already been better advertised than this. However, it marks the beginning of a campaign against this great social disease. An unusually good book which would seem to have little place in a review of this sort, except for the fact that it stresses prevention in a way which would not be expected by the operator, is *The Thyroid: Surgery, Syndromes, Treatment,* by E. P. Sloan, Thomas. *The Legal Aspects of Milk Control,* by James A. Tobey, International Association of Milk Dealers, is a valuable text for those interested in the production and handling of milk. It gives 300 court decisions of importance to those in this line of work. *Sanitary Law and Practice: A Handbook on Public Health,* by W. Robertson, Charles Porter, and James Fenton, The Sanitary Publishing Company, has reached its 8th edition. While prepared for English readers, it contains an enormous amount of information of use to all engaged in the administration of public health. *Clinical Tuberculosis,* by Benjamin Goldberg, Davis, is a monumental work in two volumes. It presents an excellent panorama of the field of tuberculosis and is a good reference book for anyone interested in this most important subject. A few of the articles might be fuller, but on the whole the book is very satisfactory, and most subjects are treated fully. *Snow on Cholera,* Commonwealth Fund, is the second volume in the series of public health classics published for Delta Omega. The republication of two rare papers by John Snow is a contribution to our epidemiological literature. *Rural Health Practice,* by Harry S. Mustard, The Commonwealth Fund, gives the result of some 20 years' experience in public health practice—federal, state, city, and county—as well as the foundations and universities. It will be noticed that he uses "public health practice" rather than "public health administration" as being a more inclusive term for the work that he discusses. The book includes a mass of information and many suggestions, and discusses basic material applicable to larger communities as well as that peculiar to strictly rural districts. *The Development of Modern Medicine,* by Richard H. Shryock, University of Pennsylvania Press. Professor Shryock is not a physician, but for years has been interested in the study of the development of medicine as it relates to the social history of humanity. He begins his story with the 17th century, when scientific medicine received its first impetus from the philosophical tenor of the age. He shows the lag in advancement which accompanied the social and intellectual confusions of the following century, but places emphasis on the years after 1800, when medicine began to emerge as a socially responsible movement. His concluding chapter points out the challenging medical problems which remain to be solved.

BIOGRAPHY

THE year has brought us several outstanding books on biography. *Disease and Destiny,* by Ralph H. *Major,* Appleton-Century, contains much history of the great epidemics of the past and also the story of a number of the well known characters of history. It is a splendid piece of work. *Great Doctors of the Nineteenth Century,* by Sir William Hale-White, Edward Arnold and Co., is a masterpiece. The author is peculiarly fitted to produce such a book and has done it well. He brings out little known facts, such, for example, as the magnanimity of Sir Samuel Wilks, who preferred that Hodgkins be known rather than himself. *British Masters of Medicine,* edited by Sir D'Arcy Power, Wood, is another excellent work, giving biographical sketches confined entirely to British medical men. *Idols and Invalids,* by James Kemble, Doubleday Doran, gives a number of postmortems on a score of celebrated historical figures. It is interesting and apparently authoritative.

Disinfection and Sterilization—*By Ernest C. McCulloch. Philadelphia: Lea & Febiger,* 1936. 525 pp., ill. with 53 engravings. Price, $5.50.

The use of disinfectants preceded the rise and acceptance of the germ theory of disease. Hence the bibliography of the subject is extensive, including as it must articles published during the past 100 years. McCulloch's book is a welcome addition to the literature because he has taken the time and pains to digest the most important contributions to the subject.

The first third of the book deals with the fundamentals of disinfection and with physical agents such as heat, light, and filtration. Newer concepts are recognized, as in the discussion on filtration which is no longer regarded as purely mechanical but rather as a physico-chemical process. The remainder of the book deals with specific chemical methods. Both pure chemical compounds and commercial preparations are discussed in an impartial manner.

It is a pleasure to have the old "oxygen" theory of the action of chlorine and its compounds properly placed on the shelf.

There is little adverse criticism to make. If the controversial subject of skin disinfection had to be included, some mention of the work of Arnold should have been made. Perhaps Spencer's recent work on the action of radium on bacteria will be included when the next edition is printed.

The author has done a fine piece of work, which will be appreciated by those who find the literature of disinfection somewhat overwhelming and who are looking for definite knowledge.

JOHN F. NORTON

Manual of Public Health Laboratory Practice—*By J. R. Currie and Contributors. Baltimore: Wood,* 1936. 378 pp. Price, $6.75.

"The book here presented is addressed primarily to medical graduates and licentiates, the only persons who in this country can acquire a registrable qualification in public health, or later hold the position of medical officer of health in a local government area. It thus assumes in the reader that knowledge of the scientific fundamentals which every qualified practitioner should have acquired during his medical training. Without such an assumption it would be impossible to convey in a work of these modest dimensions any substantial instruction at all in the variety of topics treated." The author further tells us that the book was projected 3 years before its publication, and that he would have had doubts

about the wisdom of publishing it at this time had it not been for the contributions by others.

Like other English books of this nature, it is designed for English students, especially postgraduates seeking to qualify for public health work, and to a certain extent it must be judged in the light of this purpose. The book strikes us as being well planned and well done. One might criticise the relative number of pages allotted to each subject: chemistry 90, bacteriology 50, protozoölogy 40, helminthology 50, entomology 80, and meteorology 35. The reviewer being particularly interested in bacteriology, is inclined to think that in view of the extent to which public health depends upon bacteriology, more space might have been given to this important subject.

Some rather old fashioned methods are perhaps unduly stressed, and to that extent newer methods not sufficiently emphasized. There is no mention of the phosphatase test for proper pasteurization.

The illustrations are abundant and excellent and especially so for the sections on protozoölogy, helminthology, and entomology. The printing and make-up of the book are excellent. We believe the book can be highly recommended, especially if it is read in the light of the introduction, and remembering that it is designed for those working under English conditions. We in America owe so much to England in the way of public health that this should be no drawback except possibly for immediately practical work.

MAZÝCK P. RAVENEL

Tuberculosis Education: A Guide for Professional and Lay Workers —*By Elma Rood. Madison College, Tenn.: Rural School Press,* 1936. 125 pp. Price, $1.25.

Here is a manual which, though intended primarily for members of health associations and committees who are planning educational ventures in tuberculosis, is also rich in suggestions for health officers, public health nurses, school administrators, teachers, and other community workers. Tuberculosis education is presented on a community-wide basis, with suggestions on the content of such a program, outlines for institutes, details of exhibits and dramatic sketches.

Beginning with a lucid statement of the objectives for an educational program against tuberculosis, the author proceeds, showing good evidence of a long range perspective with no facile expedients. The chapter on Possible Outcomes of a Program Against Tuberculosis considers results to be expected in the health department, in the schools, in the community at large, and in the homes. Undoubtedly the author has had first hand contact with an excellent tuberculosis program and any administrator will be helped who will test his program against these yardsticks of lasting results.

The volume includes several short articles suitable for publication and suggested as illustrative material. Permission is given to reprint this part of the manual for purposes of actual tuberculosis education. Another chapter on Institute Suggestions will be of use in agencies where more systematic instruction of the professional staff is attempted. Appropriate consideration is given to the participation of the public schools in a program of tuberculosis control, and a very suggestive test which may be given to children to measure their information is included.

Perhaps one of the most useful features of the book is a section on Visual Materials and Methods in Tuberculosis Education. Anyone preparing an exhibit or an institute will find this section helpful. A playlet on tuberculosis pre-

vention and a bibliography of readily available material complete the volume and leave a reviewer convinced that the author has produced a manual quite worth while. This volume fits in between some of the more comprehensive works on educational methods and briefer reviews of technics in this field. It can be recommended as sound, stimulating, and practical.

REGINALD M. ATWATER

The Psychology of Adolescence —*By Luella Cole, Ph.D. New York: Farrar & Rinehart*, 1936. 503 pp. Price, $3.50.

"Adolescence as a universal phenomenon among the young of all social classes is a product of modern civilization. It is something new under the sun. . . . It is only recently that education has been extended and marriage delayed until a true period of adolescence has become an almost universal phenomenon in American life." With these arresting statements the author begins the first paragraph of her book, and proceeds to indicate the economic forces basically responsible for the prolongation of the adolescent period, and to review the rapid development of secondary and higher education. She aims: (1) to include only objectively proven facts; (2) to present a relatively comprehensive picture of the adolescent years; (3) to make the book as useful as possible, by interpreting the facts to show both their general importance and their practical usefulness. The second of these aims is carried out with a success which compensates to a large degree for the occasional failure to achieve the others.

The picture of the adolescent is clearly and interestingly presented. "Normal Adolescence" is discussed analytically in the early chapters dealing, respectively, with physical, emotional, social, moral and religious, and intellectual developments. The adolescent as a total personality is then considered in chapters devoted to the following types: the normal adolescent, the delinquent adolescent, the emotional deviate, the intellectual deviate, and the vocational misfit. Chapters on the adolescent and his home, his school, and the community deal with his adjustments to his environment in an informative and constructive way, and a concluding chapter on the end of adolescence offers "pragmatic criteria" of maturity and suggestions for the prevention of adult maladjustment which are decidedly academic.

It is unfortunate that a book of such general excellence should offer as "objectively proven facts" a considerable amount of controversial material and contain inferences and generalizations for which little support is apparent. Much of the discussion of physical developments is misleading for the above reasons. The general impression conveyed is that the several bodily systems are in violent conflict with one another and are unadjusted with respect to their component parts. Differences in growth rate are said to result in "lack of balance among bones, muscles, glands, heart, lungs, brain, and viscera," and this, in turn, "is the basis for much of the misery usually accompanying growth throughout this period" (p. 17). Among the discomforts, "growing pains" are said to result from the fact that "the bones are sometimes too long for the muscles adhering to them," and clumsiness results "if his muscles lengthen faster than his bones do" (p. 26). Again, it is stated that "The most conspicuous fact in regard to development in the (circulatory) system is the disparity in growth between the heart and its arteries," and this is taken to account for the fact (?) that "during this period of adolescent growth practically all boys and girls experience

faintness, dizziness, palpitations, headaches, and restlessness" (pp. 28–9). The chapter on emotional developments, while offering much of practical value, contains a brief discussion of the nature of emotions which contradicts the rest of the material and is quite misleading. An emotional experience is said to be divisible into 3 parts—the stimulus, the internal adjustments, and the response. The "internal adjustments . . . have to be studied by the physiologist and do not constitute a psychological problem. The teacher should understand their nature, but there is nothing she or anybody else can do about them" (p. 57). In spite of this, emotional conditioning is carefully discussed and illustrated.

In Chapter X, The Intellectual Deviate, we read that "an adolescent must achieve a mental age of at least 12 before he develops even elementary concepts (of morality); a mentality of 14 is needed for any really adequate understanding of generalized principles of behavior" (p. 345), and, on the opposite page, "There is no reason to suppose that social incompetence is inherent in dull or low normal individuals."

The book, on the whole, offers much that is of value to the discriminating reader who is well grounded in the physiology and psychology of childhood, but its reading by the average parent or teacher, for whom it is intended, will be fraught with considerable risk of misunderstanding the real nature of the adolescent's problems.

FREDERICK W. BROWN

Allergy of the Nose and Paranasal Sinuses—*By F. K. Hansel. St. Louis: Mosby,* 1936. 832 pp. (61 ill.). Price, $10.00.

This monograph of Dr. Hansel's is more comprehensive than the title indicates because it covers quite extensively and intensively the whole field of allergy. The material in Chapters I to VII, XVI to XXIII, XXVII to XXVIII inclusive, is of special interest to all physicians as well as to the otolaryngologist. This material has not been readily available to either medical students or physicians.

Chapters VIII to XV inclusive present a detailed and rather uncritical discussion of anaphylaxis in animals and clinical allergy in man. The author goes into great detail in describing collection and preparation of test materials and methods of using them.

There are some errors and some omissions. Amyl nitrate is given for amyl nitrite. Recent work indicating a virus etiology for influenza is not mentioned. The sweeping statements made as to the sensitizing properties of *any* haptene fraction of bacteria need revision. The author cites the work of Zinsser and Parker on passive sensitization with antityphoid sera, but omits subsequent papers retracting certain conclusions. No reference to recent work on air conditioning and allergy was found either in the index or the contents. The author's style is reasonably clear although he is inclined at times to indulge in unusually long sentences and perhaps unnecessary repetition. On the whole the book is well written, nicely illustrated, and well bound.

There are a few errors in spelling, obviously typographical. This book can be read with profit by medical students, physicians, otolaryngologists, and allergists. The criticisms should not be regarded as detracting from the value of this exceptionally fine monograph.

N. P. SHERWOOD

Food, Nutrition and Health—*By E. V. McCollum and J. Ernestine Becker (4th ed.). Baltimore: Published by the Authors,* 1936. 154 pp. Price, $1.50.

The fourth edition of this well known little book is before us. It contains a nontechnical account of the most important discoveries in nutrition and their relation to daily life. The authors hope that the material given will assist readers in detecting misinformation now being so widely disseminated by faddists and promoters. The material given is accurate and useful.

MAZŸCK P. RAVENEL

Feeding, Diet and the General Care of Children—*By Albert J. Bell, M.D. (3rd ed.) New York: Putnam,* 1936. 316 pp. Price, $2.00.

The third edition of Dr. Bell's practical manual for mothers and nurses has been thoroughly revised. The material is presented in convenient form and is not burdened with extraneous matter. The illustrations are well chosen and the photographic reproductions are excellent.

The new edition incorporates a chapter by Dr. Ada Hart Arlitt on Some Aspects of Behavior in Early Childhood, and a timely chapter on Dentistry, by Drs. Henry Thomason and Frederick W. Black.

The feeding formulae measure up to standards of current pediatrics. The presentation of communicable diseases is simple enough for any mother to understand.

The book is well indexed and should prove helpful to all those dealing with young children. RICHARD A. BOLT

The Legal Aspects of Milk Control—*By James A. Tobey, Dr.P.H. Chicago: International Association of Milk Dealers,* 1936. 102 pp. Price, $3.00.

This book gives an analysis of over 300 American court decisions regarding the legal aspects of milk control, with discussions of the reasons for the public control of milk, sanitary regulation by the state, and by the municipality. While written primarily to give the milk industry a source book dealing with these basic questions, it is of equal value to the public health administrator and the sanitary officer.

The importance of periodic review of milk ordinances is recognized. Although the power of municipal corporations to pass legislation for the control of milk supplies and other dairy products in the interests of public health is well established in American jurisprudence according to the author, the ordinances adopted must be reasonable and not arbitrary, capricious, or discriminatory. On a number of occasions, the courts have held that specific ordinances were void because of such defects.

In view of increasing interest in pasteurization, it is noteworthy that a city ordinance requiring that no milk should be sold or distributed in the city unless it was certified or pasteurized was upheld by the Supreme Court in New York late in 1935. Said the Court:

> By a fair preponderance of the evidence, it is established, and the Court finds that the process of pasteurization of milk makes it safe for human consumption and milk which had not been pasteurized and which is termed raw milk is the subject of greatest concern by health authorities and is safeguarded only with the greatest difficulty.

The concluding chapter deals with liability in connection with dairy products, including liability of health officials. This is followed by a detailed table of cases and a useful bibliography.

IRA V. HISCOCK

Partners in Play—*By Mary J. Breen. New York: Barnes,* 1936. 186 pp. Price, $1.00.

Designed primarily for recreation leaders of young people between the ages of 12 and 30 years, this text covers such chapters as the Need for More Organized Play for Mixed Groups,

Dances and Their Management, Games for Mixed Groups, Parties and Socials, Hikes and Outings, Swimming and Water Sports, Snow and Ice Sports, Music, Drama, and Discussion Groups.

This is useful material prepared for the National Recreation Association, and National Board of Young Women's Christian Association.

CHARLES H. KEENE

A Textbook of Bacteriology and Its Applications — *By Curtis M. Hilliard (rev. ed.) New York: Ginn. The Athenaeum Press,* 1936. 339 pp. Price, $3.50.

In the preface it is indicated the book is intended as a text for nurses and students of home economics and social work. This seems to be true to an extent that might slightly detract from its use by men students. "It attempts to present the fundamental concepts of bacteriology and its most important practical applications" in contrast to textbooks that feature bacteriology in its medical aspects, but the volume—although it covers applied microbiology well—does not deal much more thoroughly with applications than do several other well known textbooks on the subject. The author's viewpoint that bacteriology and microbiology are synonymous terms would not be readily accepted by most authorities. It is a textbook on microbiology. In an introduction Professor Samuel C. Prescott suggests that the book should be useful as well to the lay reader.

The order of presentation of the material is pretty much the standard one. The historical portion is sufficiently complete for beginning students pursuing the subject for cultural purposes without the expectation of becoming bacteriologists. The illustrations and tabular material are in the main well chosen and adequate. The space devoted to yeasts seems scarcely sufficient and more material no molds might have been included. The subject of respiration of anaerobes is not too completely discussed. Some of the interpretations of bacterial dissociation that are not too generally accepted are given undue emphasis.

The public health phases of bacteriology are well presented with rather pertinently chosen references to epidemiological and statistical applications. The bacteriology of water and of milk and the preservation and refrigeration of food are covered more exhaustively than in some textbooks. Infection and immunity are given some consideration. The inclusion of sewage treatment under fermentation is perhaps a little unusual but is strikingly to the point. The chapter on The Public Health Laboratory should be instructive to most students. The microscopic Widal technic given for the examination of specimens of dried blood is so rarely used at present that it should be omitted. The statement (p. 285) that "Typhoid-bacillus carriers will give a positive Widal test in the majority of cases" should begin to disappear from textbooks.

In Appendix B and Appendix C, parts of the *Standard Methods of Water Analysis* and *Standard Methods of Milk Analysis* of the American Public Health Association that seemed important to the author are reprinted. Appendix A gives, in "a march of time" fashion, important dates in bacteriology. Some dates and names are omitted that might well be there.

In the revised edition of a textbook intended for use in a recognized institution of culture in New England it is almost alarming to find errors in grammar and faults in construction continuing almost from page to page. An occasional infinitive is neatly split! Carelessness unnecessary in a revised edition is evident. Particularly annoy-

ing is the use of pronouns to begin sentences with the antecedent discernible only after a search back through one or two sentences. The book seems to have been prepared from frequently annotated lecture notes not carefully revised.

Inconsistencies occur between statements in different portions of the book. Paragraph construction does not appear to have been given much thought. "One of the author's works on two hundred forty-two pure cultures of streptococci" (page 90) is perhaps a clear statement if he has written another treatise on the same number of cultures of this organism; "membrane of the bacteria" (page 86) should probably read "bacterium." The reference (page 92) to the "table on page 84" should refer to page 88. "Electric dissociation" (page 86) would seem to be loose usage for "electrolytic dissociation." There is a lack of nicety in the sentence construction (page 133): "Ammonia serves in a limited way as a food for plants, especially the cereals, rice preferring ammonia to nitrate; so that the organisms involved really prepare a plant food." The "tribe *Bacteriaceae*" (page 146) should read "*Bacterieae*" and seems sloppy usage at a place where the characteristics of the tribe are described. The constant use of the author's own abbreviations for the genus names of organisms is exasperating (although he has by no means a monopoly on the practice). Since the genus name of a microörganism corresponds to the family name among humans, the use of *Sal. Suipestifer*, for example, somewhat corresponds to writing James Hog. for James Hogan. The author does not adhere as closely to the names in *Bergey's Manual* as he promises to do, and *Escherichia coli* is sometimes written "*Esch. coli*" and sometimes "*Bact. coli.*"

It is annoying that almost innumerable flaws mar a really worthwhile textbook that treats bacteriology from a sensible public health viewpoint. Certain bacteriologists would consider the book elementary, but if the students in Professor Hilliard's classes at the end of their course know half of what it contains they will have a better knowledge of the sciences of bacteriology and public health than do many medical school graduates who have perused more pretentious tomes.

FRIEND LEE MICKLE

Manual of the Essentials of Good Hospital Nursing Service—*By Division on Nursing of the Council of the American Hospital Association and a Committee of the National League of Nursing Education. New York,* 1936. 38 pp. Price, $.75.

Public health officials who are also responsible for the administration of hospitals and for the standards of nursing service maintained in them will find this small publication both helpful and interesting. Prepared by a joint committee of the American Hospital Association and the National League of Nursing Education, it attempts "to set forth some of the essentials on which a good nursing service in a hospital without a school may be built and maintained. It has given no set patterns of organization and practice, but has suggested certain principles and procedures which may be applied to the nursing service of any hospital, regardless of its character or size." Of particular value is the discussion of the nursing service personnel requirement — the ratio of nurses to patients, of bedside nursing hours for ward, semi-private, and private patients, and the staffing of special services such as the operating room and outpatient department.

That this is an important factor in planning is borne out by a statement in

Hospital Organization and Management (p. 384) by Dr. MacEachern who says:

> The influence of adequate personnel on the death rate is shown by a comparison of two hospitals both well equipped, having the same medical staff and the same class of patients. In one, the ratio was one nurse to six patients and the postoperative death rate was 5.5 per cent; in the other, having a ratio of one nurse to one and one-half patients, the postoperative surgical death rate was 1.8 per cent.

A companion volume to this publication is *Essentials of a Good School of Nursing,* published by the National League of Nursing Education. Both are concisely written, outlining essentials without going into minute detail, and are thought-provoking and extremely helpful publications.

KATHARINE FAVILLE

The Development of Modern Medicine—*By Richard H. Shryock. Philadelphia: University of Pennsylvania Press,* 1936. 442 pp. Price, $4.00.

This work, written by a layman, should be read by both physician and layman. Most books on the medical topics are from the pens of physicians. This one, however, by a distinguished historian, reveals a profound insight into the problems of medicine as well as an unusual grasp of other fields with which medicine comes into the most intimate contact. The great majority of books which record the progress of medicine are devoted almost exclusively to the lives and achievements of outstanding physicians or of men working in allied sciences, while this, by contrast, although it does not in any way detract from the achievements of these outstanding men, measures these achievements in the light of their influence upon society at large. In addition, the author has delineated quite clearly the effects of various religious currents, political theories, and economic changes upon the status of the medical profession and upon the progress of medicine.

The story of the tremendous influence of the discovery of new instruments upon the progress of medicine is extremely well told. Equally interesting are the chapters pointing out the determining influence of physics, chemistry, mathematics, and of the new science of statistics.

The practising physician must feel encouraged at the author's conviction that medical science has regained public confidence to a striking degree. Some physicians who are very pessimistic on this subject will feel very much heartened after reading Professor Shryock's analysis of this matter. The closing chapters, which bring medical history up to date, are quite as interesting as the earlier ones. The brief sketch of "A Delayed Advance Against Mental Disease" is very well done. Here the author describes the work of Charcot, of Freud, and of Jung in an interesting and yet quite detached and objective manner. The chapter "Practice in a *Changing Society*" is of especial interest to the physician of today. We only wish it had been much longer. In the final chapters, "American Experience" and "Some Contemporary Questions," Professor Shryock discusses some of the problems which are agitating the medical profession at the present time. Here again the author describes the various types of medical practice with clarity and objectivity. These chapters especially impressed the reviewer as being written by a historian and not by a propagandist. Such a distinction was never more necessary, since many of our present-day writers of history are really not historians at all, but merely propagandists.

The make-up and printing of the book are exceptionally good. One typographical error, particularly unfortunate

as the book is designed for laymen as well as doctors, is found on page 267, where *flavus* is used where *favus* is evidently intended. We wish for the book a wide circulation and trust that the author will continue his illuminating studies. RALPH H. MAJOR

The Baby and Growing Child—*By Louis Fischer, M.D. New York: Funk & Wagnalls,* 1936. 260 pp. Price, $1.50.

We have here an average book on the care of babies and older children, one which has its good points and its weak points. One of the faults is that it is in spots too technical for the use of the layman, yet on the whole not complete enough for the use of anyone else. Its other major fault is one common to many similar manuals, namely, advising the family to call in the family physician for various ailments and at the same time telling what treatment the author uses, or suggesting that perhaps the doctor when he comes may do this or that. Mention of treatment should be omitted entirely when the advice is given to call the doctor.

Other points open to criticism are: the impression given that children receiving one dose of toxoid with negative Schick test following are, as a rule, protected against diphtheria for life; the curious statement that "an occasional case of diphtheria is seen in hospital and private practice even today"; statements concerning the number of days a child should be kept at home with communicable disease, no reference being made to the fact that quarantine periods are not uniform throughout the country. A slip occurs regarding the use of tomato juice as an antiscorbutic. In one place the assertion is made that probably at least five times as much tomato juice as orange juice should be used; in another place, the figure is twice as much. There is an entirely unnecessary section on anesthesia and anesthetics, featuring the use of avertin. The references to prenatal care are sketchy.

On the whole, while this is a popular manual by an excellent pediatrician, one has to confess that all the information the mother of young children can use wisely can probably be more easily obtained from the pamphlets offered free by federal or state health authorities than from this or most other books of its kind. MERRILL E. CHAMPION

Medicolegal Cases: Abstracts of Court Decisions of Medicolegal Interest. *Chicago: American Medical Association,* 1936. 888 pp. Price, $5.50.

Between 1931 and 1935, abstracts of about 900 court decisions of direct interest to physicians were prepared by the Bureau of Legal Medicine and Legislation of the American Medical Association, and published in the weekly numbers of the *Journal of the A.M.A.* These abstracts have now been issued in this useful volume, which supplements a previously published book of 1,270 pages giving similar court decisions for the period from 1926 to 1930 inclusive.

Although the abstracts are arranged in a rather hit-or-miss fashion, probably as they came in, an excellent index permits the reader to locate quickly any subject in which he is interested. The physician may be astounded at the number of malpractice actions that have been before the courts, but by perusing them he may be able to avoid some of the legal troubles that have beset his colleagues.

A considerable number of cases on various aspects of public health are included and will be of special interest to sanitarians. There is a table of cases, alphabetically arranged, which would be even more valuable if complete citations to all the various law reporters

were given and the year of each decision was included. This well printed book should be a valuable addition to the libraries of all practising physicians, health officials, and attorneys interested in legal medicine. JAMES A. TOBEY

The Riddle of Woman: A Study in the Social Psychology of Sex—*By Dr. Joseph Tenenbaum. New York: Lee Furman, Inc.* 477 pp. Price, $3.50.

Dr. Tenenbaum has presented a well organized survey of "The Riddle of Woman." He has discussed a vast variety of details concerning woman as a virgin, wife and widow, spinster, mother, and adulteress, as mother-in-law, witch, as siren, and prostitute.

The public health officer will find very little of significance or advantage in this volume which, while concerned with the social psychology of sex, reveals little interest in the social aspects of female activities as affecting human welfare. While there is an implication that prostitution has changed from a moral problem to a social menace, he regards it as "the moral safeguard of marriage, a bulwark of monogamy, an insurance premium against sexual anarchy." This has little to do with the problems of syphilis and gonorrhea, segregated areas, or the transmission of dysgenic factors through venereal disease.

A momentary discussion of the sex linkage of hemophilia and color blindness practically represents the breadth of the public health outlook of the author. There are no significant references to diseases peculiar to woman or those transmitted by them.

The inadequacy of the volume, from the standpoint of public health, is due to the fact that the author emphasizes the underlying instinctual psychology in which sex forms the most important factor. Some of the data are open to question because of too-ready generalization from specific behavior among certain primitive people.

While Dr. Tenenbaum has sought information from the collateral fields of biology, sociology, psychology, and anthropology, he has failed to unify them into any public health concepts. Hence the volume is to be regarded as merely a book of interest rather than of service to public health workers.

The presentation is journalistic in style, readable, and entertaining. It may, perhaps, afford some pleasurable recreation for the health officer who is weary with his daily task and wishes to dwell upon a riddle that still remains to be answered. IRA S. WILE

Vitamins and Other Dietary Essentials—*By W. R. Aykroyd, M.D. (2nd ed.) London: William Heinemann, Ltd.,* 226 pp. Price, $2.75.

This book has had the advantage of criticism since 1932. The author has avoided giving detailed diets, specimen menus, etc., his chief object being to interest the general reader in a subject, the importance of which is being more and more recognized every day. The usual subjects are considered and the author goes at some length into the influence of diet on teeth. He evidently sides with Mrs. Mellanby on this matter. Some will accept what he says and many will not.

The book is interestingly written and well repays the reader for time spent on it. The make-up and printing are excellent. MAZÝCK P. RAVENEL

Hygiene—*By Walter W. Krueger. (2nd ed.) Philadelphia: Saunders,* 1936. 294 pp. Price, $1.75.

This is a revision, to some extent, of a text first published in 1932. The chapter on Posture and Its Bearing on Health might well present more clearly the newer concept that disorders of the

human body cause poor posture perhaps more often than does poor posture cause body disorders.

The first edition was reviewed in the *Journal,* April, 1933, p. 400.

CHARLES H. KEENE

Chemistry of Food and Nutrition—*By Henry C. Sherman. (5th ed.) New York: Macmillan,* 1937. 640 pp. Price, $3.00.

The first edition of this book was published in 1911. Ever since its first appearance it has been a standard text. All that need be said of this edition is that the tremendous amount of research in the chemistry of food and nutrition has made necessary a complete rewriting of the book. The arrangement has been somewhat changed for the incorporation of new material and the number of chapters of the book have been increased to 27. This edition, for the first time, gives the averages of a new order of precision with statistically determined probable errors and coefficients of variation.

The name of the author is sufficient guarantee of the completeness and accuracy of the book. The printing and make-up are excellent.

MAZŸCK P. RAVENEL

Applied Dietetics: The Planning and Teaching of Normal and Therapeutic Diets—*By Frances Stern. Baltimore: Williams & Wilkins,* 1936. 236 pp. Price, $3.00.

This book is a logical development of the long experience and mature judgment of the author in her work at the Boston Dispensary. The volume is packed with tables, charts, and formulae of valuable information on food composition, nutritional requirements, and diet therapy. Here may be found in readily accessible form all the material required to build diets for any disease, condition, or deficiency. Causes, symptoms, and treatment of dietary deficiencies are discussed. For the benefit of the social worker, the influences in the physical and mental life of the patient and the effect on his food habits are explained. The author presupposes the reader to have a fundamental knowledge of the physiology of the body and the chemistry of foods and nutrition. The book will serve as an excellent guide to physicians, nurses, institutional and social workers, and to dietitians it is a veritable handbook. The printing is clear and the binding good.

C. R. FELLERS

Eugenic Sterilization—*Committee of the American Neurological Association. Abraham Myerson and Committee, consisting of James B. Ayer, Tracy J. Putnam, Clyde E. Keeler, and Leo Alexander. New York: Macmillan,* 1936. 203 pp. Price, $3.00.

This report was presented and discussed at the meeting of the American Neurological Association in 1935. It is a part of the legal medicine inquiry made by the New York Academy of Medicine through Carnegie Foundation funds. The report attempts to evaluate in a critical way the inheritance of mental disease, feeble mindedness, epilepsy, and crime from the standpoint of eugenic sterilization. There are therefore two purposes served. One is to gather data on the inheritance factors, the second is to test the value, necessity, and ultimate benefit to society of sterilization in order to breed out the genetic load which these diseases are thought to provide.

The introductory chapter is given up to definitions of the various terms used in genetic literature—eugenics, sterilization, inheritance, etc. The second chapter contains a résumé of all the state sterilization laws and some of the foreign countries. This is a valuable contribution. Nowhere else in such a brief

form is this material available. The rest of the volume is concerned with the more detailed consideration of the justification for sterilization and the data available in any given disease or given individual upon which the necessity for sterilization can be based. The inheritance factors in the production of diseases commonly thought to be genetically carried on from one to the succeeding generation are subjected to a critical analysis. The result is to throw a great deal of doubt upon the generalizations that have been made and upon which the sterilization laws have been based. Epilepsy, for example, has been found to be almost without inheritable factors.

The inheritance of crime or criminal tendencies is so complicated with environmental factors that no certain estimate can possibly be established. The inheritance factors in dementia praecox and manic depressive psychoses—at first sight so definite become less so as the statistical material is analyzed and as the question of marriage and reproduction is brought into realistic relationship with the problem.

The facts that schizophrenics do not frequently marry and that the sex impulse is so frequently lacking or very much lessened in these individuals appear to point to a natural solution of the inheritance probability in these cases. The same clear-cut critical and skeptical point of view is present in the manic depressive group. The question is put as to the worthwhileness of the contribution to society of those roughly belonging to this group. It seems far to outweigh the amount of social damage that might conceivably follow marriage and reproduction in this group.

Running throughout this book is the fine critical and socially sensitive point of view of Myerson, Chairman of the Committee, who no doubt controlled and guarded the study of its write-up.

Recommendations: (1) Laws concerning sterilization should be voluntary and regulatory rather than compulsory. (2) Laws should be applicable both to state and private institutions. (3) Machinery for administering sterilization should be composed of boards with special training. (4) Adequate legal protection for such boards and for surgeons carrying out sterilization procedures.

Selective sterilization might be applied to: (1) Huntington's chorea, (2) feeblemindedness, (3) dementia praecox, (4) manic depressive psychosis, (5) epilepsy. These are the categories, but the whole spirit of this book is against anything but the most careful selection. If this is done the sterilization necessity will be found to be very small.

This is a good book. It is brief, readable, and entirely in the spirit of scientific inquiry. It is a good antidote for the loose thinking that has become prevalent on the subject of eugenic sterilization. SIDNEY I. SCHWAB

Tissue Immunity—*By Reuben L. Kahn. Springfield, Ill.: Thomas,* 1936. 707 pp. (ill.) Price, $7.50.

Kahn has described quite simply but very clearly a large number of carefully planned experiments on rabbits in the hope of elucidating some of the mysteries of tissue immunity. The results are recorded and summarized. The chapters end, as a rule, with what the author calls clinical considerations.

It is disappointing to find in a monograph on *tissue immunity* that when the author discusses his tissue experiments, he makes no reference to specific anatomical structures or definite physiological mechanism but deals only in rather abstruse discussion. He seems neither to think in terms of lymphatics, capillaries, motor, sensory and vasomotor mechanisms, irritability and per-

meability factors, endocrine functions nor to recognize the extensive distribution in the skin and other tissues of phagocytic cells and the importance of the proteolytic enzymes which they contain.

The first chapter is a philosophical and to some extent a historical discussion of the rôle of the tissues in immunity and gives the impression that the author conceives of tissue-antigen reactions as occurring independently of antibody. The following quotations (p. 390) indicate that such a conception is not held by Kahn:

> We refer to antibodies as immune globulin because by this means it seems simpler to correlate the relationship between a passively-immunized and an actively-immunized animal. Suppose it is assumed that, as a result of active immunization, there is a shift in the albumin-globulin ratio in the tissue cells, which increases the globulin content. And suppose it is assumed further that one of the outstanding characteristics of this new globulin is its marked affinity for, or combining power with, the specific antigen. Then, when the tissue cells produce an amount of this globulin which is in excess of that which can be retained within their cell structures, some of the globulin will "overflow" and be washed away from the cells. These cellular washings will accumulate in the body fluids, and soon, these fluids will exhibit the property of combining with the antigen.

Also (p. 103):

> Suppose it is assumed that the basic change in a cell, as a result of immunization, is the formation of immune globulin within the cell and that it is this immune globulin that has a marked affinity for the antigen.

On page 391 he says:

> All tissue cells are capable of producing immune globulin or antibodies and that some cells possess this capacity to a greater extent than others.

Further on page 398:

> The extent of the immunity of the passively-immunized animal to a protein antigen is dependent upon the cellular washings or circulating antibodies of the actively-immunized animal, while the extent of the immunity of the latter animal is dependent upon immune globulin which cannot be washed away from the cells and which is an inherent part of their structure, in addition to any antibodies that might be present in the circulation.

It is clear from the wording and by a definite statement on page 97 that, "The nature of the tissue-antigen union can only be surmised."

The conception that *all* tissue cells are capable of producing a defensive substance was apparently held by Ehrlich and can be supported by references to results of various investigators since. By original, simple, and quite ingenious technic Kahn demonstrates a great many phenomena observed by using other methods. While there will probably be little controversy over the phenomena he describes, it is certain that his philosophical interpretations of what he sees and of what goes on behind the scenes will not meet with universal approval. In several places he explains the disappearance of antigen from the blood and tissues as due to the proteolytic action of immune globulin. On page 434 he speaks of embryonic tissue as more resistant than older tissue. As a general statement this will be questioned. On pages 461–462 he speaks of racemized proteins, gelatin and proteoses as haptens in the sense used by Landsteiner. These are only a few of the author's hypotheses that will arouse criticism. The author admits these opinions are not capable of proof at present but hopes they will stimulate greater interest in tissue immunity.

The book is well arranged and indexed and is exceptionally free from typographical errors. The publishers are to be congratulated upon their achievement. N. P. SHERWOOD

Health-Happiness-Success Series (ill.)—*By William E. Burkard, Ph.D., Raymond L. Chambers, Ph.D.,*

Frederick W. Maroney, M.D. Chicago: Lyons and Carnahan, 1936. *Health By Doing* (4th Grade), 314 pp., $.57; *Building for Health* (5th Grade), 309 pp., $.57; *The Body and Health* (6th Grade), 313 pp., $.57.

Didactic teaching of health precepts, physiology, preventive medicine, and community health and sanitation characterize this series of books prepared for the higher elementary grades. In the make-up of the books the bold face topical headings throughout make a strong, and not pleasant, contrast to the occasional semi-pastel colored plates of illustrations. ANNA B. TOWSE

Sickness and Insurance — *By Harry Alvin Millis. Chicago: University of Chicago Press,* 1937. 166 pp. Price, $2.00.

This small volume is a survey of the social and economic problems created by sickness, and methods suggested to remedy them. The volume offers the traditional presentation of the subject by first analyzing the problem in the United States; then reviewing the European experience with insurance plans, dwelling in some detail on experiences in England, France, and Germany; and concludes by discussing proposals suggested for this country.

No new information or light is thrown on the problem, but much of the pertinent data is succinctly introduced with original sources carefully indicated. The author maintains a very dispassionate attitude, and is fair to opposing sides in controversial matters. The material is brought carefully to date, so that individuals who last reviewed the subject when the tempest caused by the report of the Committee on the Costs of Medical Care was at its height will know what developments have occurred since then.

The author agrees with economists and social workers as opposed to the spokesmen of the American Medical Association in believing that health insurance is a need second in importance only to unemployment insurance. He agrees that a distribution of financial burden is required for the lower income groups, and suggests that contributions by employees, employers, and the government is preferable to payments from tax funds only. He considers it sound to inaugurate a compulsory plan from the outset in contrast to various voluntary plans. To achieve coöperation of the reluctant medical profession, he advocates that in the beginning at least, the insurance should cover only high cost illnesses, and that it should be integrated with the growing group hospital payment plans. The author agrees with all students of the problem that the financial benefits should be separated from the medical benefits, and suggests that this can be easily accomplished through the organization set up by the Social Security Act. Even though an economist, the author is appreciative of the medical requirements of the problem, as well as the public health and preventive aspects of it.

This volume, in my opinion, provides an excellent introductory discussion of the problem for the student, social worker, or physician—complete, yet brief, and written as readably as material can be which includes statistical matter and descriptions of insurance plans. W. R. WILLARD

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Tuberculin Testing of School Children—What is being done in the several states in the tuberculin testing program is summarized in this committee report that discusses some of the problems which accompany and follow the general application of the test. Incidentally, the paper is the first in what amounts to a new publication in the health field. All health workers will want to see it.

ANON. Tuberculosis in Children. J. School Health. 7, 1:1 (Jan.), 1937.

A Better Chance for the Country Child—This is a thoroughgoing presentation of the problems involved in programs of rural education and the need for more study and research. It discusses the need for more and better schools, better teachers, location of schools in relation to population and its mobility, and a better administrative set-up.

CYR, F. W. Needed Research on the Reorganization of School Districts in Rural Areas. Teachers College Rec. 293, 38:4 (Jan.), 1937.

The Future in Medical Care—Loss of income due to unemployment eventually will be covered by insurance. Will not the same protection be wanted for illness? This is a stimulating discussion of the trends in medical science, public welfare and social security, and a prediction of the changes which will result in public health and medical practice.

DAVIS, M. M. Next Moves in Medical Care. Survey Graphic. 24, 2:70 (Feb.), 1937.

Sterilization of Supplies—Experiments are described which show need for knowledge of the temperature as well as pressure attained when steam sterilizers are used. Safe sterilization can be accurately defined only on the basis of actual temperature attained. Operators of sterilizers usually place confidence on the final pressures observed. Pressure, *per se,* does not indicate temperatures sufficient for the destruction of microörganisms. This is one of a series of articles representing results of research done at Western Reserve University in Cleveland.

ECKER, E. E. Sterilization Based on Temperature Attained and Time Ratio. Mod. Hosp. 86, 48:2 (Feb.), 1937.

All About Tularemia — Where, when, and how to catch the Bacterium tularense.

FRANCIS, E. Sources of Infection and Seasonal Incidence of Tularemia in Man. Pub. Health Rep. 52, 4:103 (Jan. 22), 1937.

Paratyphoid Fever—This dreadful exhibit of American sanitary carelessness, a row of company owned miners' houses, is paraded for the edification of the Canadian sanitarians. After the epidemic had peppered the homes, the polluted well was closed and sanitary privies were installed.

FRANKLIN, J. P., and HALLIDAY, C. H. A Water-borne Outbreak of Paratyphoid A Fever. Canad. Pub. H. J., 28, 2:82 (Feb.), 1937.

Prohibition and Drinking—During 1920, the first year when alcoholic drinks were hard to get, drunkenness showed a marked reduction in Massachusetts. For the next 4 years, drunks began to get access to all sorts of alcoholic preparations and poisoning was more common. From 1925 to 1933

decreases were recorded in rates of deaths from alcoholism, alcoholic psychoses, and arrests for drunkenness. During the first repeal year, the rates began to rise. Time will tell the net result.

GUTHRIE, R. H., and DAYTON, N. The Incidence of Alcoholic Psychoses in Massachusetts, 1917–1935. New Eng. J. Med. 216, 5:193 (Feb. 4), 1937.

Control of Rheumatism—Public health measures which may be taken to prevent rheumatic heart disease are excellently summarized in this brief paper. With so much that needs doing, it is a reflection upon modern health administration that officials take so small a part in urging the amelioration of the worst factors.

HEDLEY, O. F. Salient Public Health Features of Rheumatic Heart Disease. Pub. Health Rep. 52, 6:164 (Feb. 5), 1937.

Deer Flies Spread Tularemia—Insect transmission of tularemia is possible, so unless precautions are taken, construction projects in highly infected districts may be jeopardized. This has a military implication also.

HILLMAN, C. C., and MORGAN, M. T. Tularemia. J.A.M.A. 108, 7:538 (Feb. 13), 1937.

Vaccines and Sera—Plain truth about preventive inoculation by an author who concludes that there are three groups of treatment: (a) those that are unquestionably of value, *i.e.*, cowpox vaccine and diphtheria toxoid; (b) those that give equivocal benefits and hence are luxuries, *i.e.*, typhoid and respiratory vaccines and scarlet fever toxin; and (c) those for which there is little or no evidence of value, *i.e.*, whooping cough vaccine and measles globulin.

O'HARA, D. Preventive Inoculations. New Eng. J. Med. 216, 6:236 (Feb. 11), 1937.

School Child Health — Effective utilization of school grouping for improving child health (supplementing the work of the family physician) is presented in a detailed plan for school medical and dental service.

SMILEY, D. F. An Approach to the Problem of School Medical and Dental Service. J.A.M.A. 108, 6:436 (Feb. 6), 1937.

BOOKS RECEIVED

HEALTH QUESTIONS ANSWERED. By W. W. Bauer. Indianapolis: Bobbs-Merrill, 1937. 368 pp. Price, $2.00.

A LAYMAN'S HANDBOOK OF MEDICINE. Richard C. Cabot. rev. ed. New York: Houghton Mifflin, 1937. 541 pp. Price, $2.50.

AUTOPSY. DIAGNOSIS & TECHNIQUE. By Otto Saphir. New York: Hoeber, 1937. 342 pp. Price, $5.00.

BABY EPICURE. By Elena Gildersleeve. New York: Dutton, 1937. 141 pp. Price, $1.75.

GROUP LEADERSHIP, WITH MODERN RULES OF PROCEDURE. By Robert D. Leigh. New York: Norton, 1936. 295 pp. Price, $2.50.

BIRTH CONTROL FOR SAINTS AND SINNERS. By Teunis Oldenburger. Grand Rapids: Calvin Press, 1934. 330 pp. Price, $2.50.

CHILDREN HANDICAPPED BY CEREBRAL PALSY. Psychological Factors in Management. By Elizabeth Evans Lord. New York: Commonwealth Fund, 1937. 105 pp. Price, $1.25.

SAFE CHILDBIRTH: THE THREE ESSENTIALS. By Kathleen Olga Vaughan. Baltimore: Wood, 1937. 154 pp. Price, $3.00.

FEEDING OUR CHILDREN. By Frank Howard Richardson. New York: Crowell, 1937. 159 pp. Price, $1.00.

THE INTIMATE SIDE OF A WOMAN'S LIFE By Leona W. Chalmers. New York: Pioneer, 1937. 128 pp. Price, $1.50.

GIVE YOUR HAIR A CHANCE. By John W. King. Cambridge: Bradner, 1937. 71 pp. Price, $1.00.

GUIDING YOUR LIFE. By Josephine A. Jackson, M.D. New York: Appleton-Century, 1937. 352 pp. Price, $2.50.

A WOMAN SURGEON. By Rosalie Slaughter Morton. New York: Stokes, 1937. 399 pp. Price, $3.00.

ASSOCIATION NEWS

SIXTY-SIXTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION

New York, N. Y.
October 5-8, 1937
HEADQUARTERS: HOTEL PENNSYLVANIA

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ARE YOU GOING TO ENGLAND THIS SUMMER?

THE Royal Sanitary Institute will hold its Health Congress in Birmingham, England, July 12 to 17, 1937, and has extended a cordial invitation to the American Public Health Association to appoint delegates.

The Executive Board at its meeting on December 18 authorized the Executive Secretary to appoint Fellows who might be in England during the Congress to represent the Association. The Executive Secretary will be very happy to have word from any Fellow who plans to be in England at that time.

PUBLICATIONS NEEDED

THERE is a scarcity of several numbers of the *Journal*—January, 1935; June, 1935; November, 1935; February, 1936; and July, 1936; also *Year Book* for 1934–1935.

If any members can spare copies of these publications, the Executive Office will greatly appreciate it if they will send them in to headquarters—50 West 50 Street, New York, N. Y.

NEWS FROM THE FIELD

TWENTY-FIFTH ANNIVERSARY OF N.O.P.H.N.

THE National Organization for Public Health Nursing celebrated the Twenty-fifth Anniversary of its foundation with a luncheon at the Hotel Roosevelt, New York, on March 18. There were more than five hundred nurses and friends present.

The meeting was presided over by Charles C. Burlingham. The two principal speakers were Livingston Farrand, M.D.,* President of Cornell University, and Elizabeth G. Fox, R.N.,* Executive Director of the Visiting Nurses Association of New Haven, Conn. An introduction was given by Amelia Grant, R.N.,* the President of the N.O.P.H.N.

It was an inspiring occasion and inaugurated the campaign for an endowment of $75,000 to carry on its important Silver Jubilee Program.

As George E. Vincent, former President of the Rockefeller Foundation, said:

"The National Organization for Public Health Nursing has finely earned the right to celebrate its twenty-fifth anniversary, and to make an appeal for an appropriate gift from the American people."

MAY DAY—CHILD HEALTH DAY, MAY 1

ON May Day—"National Child Health Day"—a program entitled "Health protection for every child" will be broadcast from coast to coast over the Columbia Broadcasting System from a luncheon in New York at 2:30 to 3:00 P.M., E.D.S.T.

As a measure of coöperation in the celebration of May Day, now under the auspices of the U. S. Children's Bureau, the Child Welfare League of America has arranged this broadcast luncheon in which are joining the national councils and associations for health, social work, safety, the churches, educational groups, civic and service groups, whose activities contribute toward protecting the children of America.

Simultaneously throughout the country will be held local demonstrations for children with the accent on health—luncheons, meetings, and even breakfast parties in the far-time zones—to receive the inspiration and enthusiasm of national leaders for children on the master program.

SAFETY QUARTERLY

THE *American Journal of Safety* is a new quarterly magazine, the official organ of the American Association for Motor Vehicle Safety. Its editors are Henry Howard Kafka, Dr. Harry B. Litchfield, and David Brumer.

The first issue will be released in May.

The magazine is committed to medical research and will make a study into the causes of motor vehicle death and injury and prescribe preventive measures as well as cures. It also aims to foster Federal legislation for the establishment of a central bureau of registration for the tabbing of all former mental and narcotic patients, for the checking by state motor vehicle agencies before the issuance of drivers' licenses.

Communications should be addressed to 601 Brightwater Court, Brooklyn, N. Y.

MATERNAL WELFARE

THE American Committee on Maternal Welfare, Inc., will have a luncheon meeting at the Hotel Dennis in Atlantic City, New Jersey, on June 9. Short addresses will be made by Dr. Malcolm T. MacEachern, Dr. H. G. Weiskotten † and Dr. Ray Lyman Wilbur. It is requested that tickets be purchased directly from the hotel, and well in advance, so that the service will be expedited.

GEHRMANN LECTURES

THE Gehrmann Lectures for 1936–1937, at the University of Illinois College of Medicine, were delivered by Dr. Thomas Parran,* Surgeon General, U. S. Public Health Service, and President of the American Public Health Association, in Chicago, on March 22, 23, and 24. Dr. Parran's subjects were "Health as a Factor in Social Security," "Industrial Hygiene," and "Syphilis."

TEST OF ACCIDENT FATALITY FORMS

FOLLOWING the wishes of the Accident Prevention Conference of The Department of Commerce, of the Advisory Committee to the Division of Vital Statistics, Bureau of the Census, and of the Vital Statistics Section of the American Public Health Association, the Federal Division of Vital Statistics will make a preliminary test of certain accident-reporting forms. These forms have been developed upon the basis of work done by Dr. Earl G. Brown * of the Kansas State Board of Health, and by the Illinois Division of Highways. After these forms have been subjected to an experimental field study, they will be proposed as standard forms for use in the states, in accordance with the suggestion of the Vital Statistics Section of the American Public Health Association.—*The Registrar*, Dept. of Commerce, Bureau of the Census, 2, 3 (Mar. 15), 1937.

CINCHONA

OF interest to physicians and the trade is the establishment of Cinchona Products Institute, Inc., at 270 Madison Avenue, New York. Its chief objects are to coöperate with anyone interested in the use and application of products derived from *Cinchona* bark, both quinine and the other alkaloids; and to foster both medical and industrial research on these products.

SOUTHERN CALIFORNIA ASSOCIATION OFFICERS

THE following new officers were elected by the Southern California Public Health Association at its recent Annual Meeting.

President, Kenneth H. Sutherland, M.D.,† Santa Ana

President-elect, G. E. McDonald, M.D.,* Long Beach

First Vice-President, George F. Cottle, M.D.,† San Pedro

Second Vice-President, R. C. Main, M.D.,* Santa Barbara

Secretary-Treasurer, R. L. Kaufman, M.D.,† Whittier

PERSONALS

KATHARINE FAVILLE, R.N.,† has been appointed Director of the Henry Street Visiting Nurse Service. Miss Faville, who is Associate Dean of the Frances Payne Bolton School of Nursing at Western Reserve University, will begin her new duties in the early autumn, succeeding Marguerite Wales, R.N.,* who resigned last summer to head the Nursing Education Department of the W. K. Kellogg Foundation. Elizabeth Mackenzie, R.N., who has been Acting Director since Miss Wales's resignation, will continue as Associate Director of Nurses.

DAISY M. O. ROBINSON, M.Sc., M.D.,* lecturer on the staff of the Division

* Fellow A.P.H.A.
† Member A.P.H.A.

of Social Hygiene of New York State since 1927, retired from state service on March 1.

JULIUS KATZ, M.D., has been appointed clinic physician in the Division of Tuberculosis of New York State, effective February 15.

DR. JOHN W. BROWN,* former Texas State Health Officer has become Director of Public Health in Houston, Tex.

WILLIAM E. WOODALL, Chief Disinfector of the Baltimore City Department of Health, recently resigned, after being associated with the Department 34 years.

DR. SUSIE HURST THOMPSON, formerly of Gary, Ind., has been appointed to take charge of District No. 2 of the Children's Fund of Michigan, including the counties of Ogemaw, Alcono, Iosco, and Oscoda, with headquarters in West Branch. She succeeds Dr. Gladys J. Kleinschmidt, of Ann Arbor, who resigned November 1. This work is conducted in cooperation with the Michigan State Department of Health.

DR. JACKSON L. SADLER was recently named as Assistant Director of Child and Maternal Health by the Colorado State Board of Health.

DR. JESSE B. HOPKINS, of Pound, Va., has been appointed to the staff of the Bureau of Communicable Diseases of the Virginia State Department of Health.

J. LELAND TANNER, M.D., M.P.H.,† of Henderson, Ky., was recently elected President of the Green River Valley Public Health Association.

DR. HERBERT H. HUNT, of Mayfield, Ky., has been appointed Health Officer of Graves County, succeeding Dr. John R. Pryor.

DR. ERNEST L. GATES, of Greenville, Ky., has recently been appointed a member of the Kentucky State Board of Health.

DR. VESTER M. RUTHERFORD, of Woodward, Okla., has been appointed Health Officer of Woodward County.

CHARLES HEARD FIELD,† of Albany, Ga., Sanitary Engineer and Director of Malaria Control for Dougherty County, Ga., has been appointed Sanitary Engineer in Charge of Malaria Control for Chatham County, with offices at Savannah, Ga., effective March 1.

HELMUTH H. SCHRENK,† of Pittsburgh, Pa., has been appointed Chief Chemist of the Health Division of the U. S. Bureau of Mines. He succeeds William P. Yant,† resigned, and will have his headquarters at the Pittsburgh Experiment Station.

R. HESLOP PAYNE, M.D.,† of Tripp, S. D., has been appointed Director of a new health unit established in Hutchinson County, with headquarters at Tripp.

GAIUS E. HARMON, M.D.,* recently of the Chicago Board of Health, became Epidemiologist for the Department of Health in the City of Detroit on March 1. In this capacity, he will have charge of the epidemiological and statistical work in connection with the new program in Detroit for tuberculosis control.

HUGH R. LEAVELL, M.D.,† Director of Health of Louisville, Ky., has assumed full-time responsibility for The Department of Public Health, and for the first time Louisville now has a full-time Health Officer. Civil Service provisions have been extended to include the Health Department and an emergency flood appropriation for the Health Department of $75,000 has become available.

HAROLD M. KELSO, M.D.,† has assumed his duties as Health Officer in the recently organized Pulaski County Health Department, Virginia.

* Fellow A.P.H.A.
† Member A.P.H.A.

L. J. ROPER, M.D.,* formerly City Health Officer of Portsmouth, Va., was appointed recently to join the Virginia State Department of Health, Richmond, Va. He will coöperate with Dr. Otis L. Anderson in the development and supervision of the venereal disease program.

SAMUEL FRANT, M.D.,† Epidemiologist of the New York Department of Health, has been placed in charge of the Bureau of Preventable Diseases of New York City.

DR. R. CAMPBELL MANSON, formerly assistant to R. G. Beachley, M.D.,* in the Southwest Health District, has been appointed Acting Health Officer of the Isle of Wight-Nansemond-Suffolk Health District, Virginia.

DR. CLINTON C. FULLER, of Columbus, Kans., has been appointed Health Officer of Cherokee County.

ADOLPH WEINZIRL, M.D.,† Epidemiologist of the Health Department of Baltimore, Md., has been appointed Health Officer of Portland, Ore. He will succeed John G. Abele, M.D.,† who will become City Epidemiologist.

CHARLES HOWE ELLER, M.D., Dr.P.H.,† recently Health Officer of Charlottesville, Va., and Secretary of the Albemarle County Board of Health, has been appointed Director of the Bureau of Rural Health in the Virginia State Health Department. He succeeds Edwin L. McQuade, M.D., Dr.P.H.,* who resigned because of ill health.

HAROLD H. MITCHELL, M.D.,* formerly President of the New York State Association of School Physicians, has been appointed a District Health Officer in New York City.

WILLIAM F. WILD, M.D.,* of Suffolk, Va., Health Officer of Suffolk and the Counties of Nansemond and Isle of Wight, Va., has been appointed a District Health Officer in New York City.

KENNETH F. MAXCY, M.D., Dr.P.H.,* Professor and head of the Department of Preventive Medicine and Public Health of the University of Minnesota School of Medicine, Minneapolis, has been selected as one of the scientific directors of the International Health Division of the Rockefeller Foundation.

ALFRED R. MASTEN, M.D.,† of Denver, Colo., has been named Director of the Division of Tuberculosis Control created by the Colorado State Board of Health.

FRANKLIN M. FOOTE, M.D.,† of Elizabethton, Tenn., has been appointed Chief of the Division of Local Health Administration of the Connecticut State Department of Health. He succeeds Benjamin G. Horning, M.D.,* who was appointed Health Officer of Hartford.

MARTHA L. CLIFFORD, M.D.,† Assistant Director of the Bureau of Child Hygiene of the Connecticut State Department of Health, has been named Director; and Dr. Martha A. O'Malley, of Waukon, Ia., has joined the Bureau staff.

GEORGE W. COX, M.D.,† of Del Rio, Tex., has been named Health Officer of Texas, to succeed John William Brown, M.D.*

HENRY F. R. WATTS, M.D., of Dorchester, Mass., has been appointed Health Commissioner of Boston, succeeding the late Dr. William B. Keeler.†

DEATH

DR. LOUIS V. WALDRON,† Commissioner of Health, Yonkers, N. Y., died March 13 from pneumonia following an automobile accident. Dr. Waldron, who has served about one years, is the third Commissioner of Health of Yonkers to die in office within 2 years.

* Fellow A.P.H.A.
† Member A.P.H.A.

CONFERENCES AND DATES

American Chemical Society. Chapel Hill, N. C. April 12–15.

American College of Physicians. St. Louis, Mo. April 19–23.

American Pediatric Society. University, Va. April 29–May 1.

American Physiological Society. Memphis, Tenn. April 21–24.

American Public Health Association—66th Annual Meeting. Hotel Pennsylvania, New York, N. Y. October 5–8.

American Society for Experimental Pathology. Memphis, Tenn. April 21–24.

American Society for Pharmacology and Experimental Therapeutics. Memphis, Tenn. April 21–24.

American Society of Biological Chemistry. Memphis, Tenn. April 21–24.

American Water Works Association—Four States Section (Eastern Pennsylvania, Maryland, Delaware, Washington, D. C.) Joint meeting with Pennsylvania Water Works Operators Association. Bellevue-Stratford Hotel, Philadelphia, Pa. April 22–23.

Arizona Public Health Association—joint meeting with New Mexico Public Health Association (during annual meeting of Western Branch, A.P.H.A.). Phoenix, Ariz. April 12.

California Tuberculosis Association. Riverside, Calif. April 5–6.

Children's Bureau, U. S. Department of Labor—25th Anniversary Dinner. Hotel Mayflower, Washington, D. C. April 8.

Conference of State and Provincial Health Authorities of North America. Washington, D. C. April 5–6.

Federation of American Societies for Experimental Biology. Memphis, Tenn. April 21–24.

May Day–Child Health Day 1937. Saturday, May 1.

Missouri Public Health Association. Springfield, Mo. April 29–30.

Mother's Day. May 9.

National Academy of Science. Washington, D. C. April 26–28.

National Organization for Public Health Nursing. Silver Jubilee Meeting—in conjunction with Annual Meeting of the American Public Health Association. Hotel Pennsylvania, New York, N. Y. October 4.

New Mexico Public Health Association—joint meeting with Arizona Public Health Association (during annual meeting of Western Branch, A.P.H.A.). Phoenix, Ariz. April 12.

Salmon Committee on Psychiatry and Mental Hygiene. Fifth Series of Thomas William Salmon Memorial Lectures, to be given by William Healy, M.D. New York Academy of Medicine. April 9, 16, 23.

Society of State Directors of Physical and Health Education. New York, N. Y. April 21–24.

State and Provincial Health Authorities of North America—Annual Meeting. Washington, D. C. April 7–8.

State and Territorial Health Officers Conference with the Surgeon General. Washington, D. C. April 7–8.

Western Branch, American Public Health Association—Eighth Annual Meeting. Phoenix, Ariz. April 13–15.

FOREIGN

Hawaii Territorial Medical Association. Hilo, T. H. April 30–May 2.

Empire Conference on the Care and After-Care of the Tuberculous. Over-Seas House, St. James's, London. May 3–8.

Tuberculosis Association. Manchester, England. June 10–12.

National Association for the Prevention of Tuberculosis. Bristol, England. July 1–3.

Fifth International Congress of Hospitals. Paris, France. July 5–11.

Health Congress of The Royal Sanitary Institute. Birmingham, England. July 12–17.

British Medical Association. Belfast, Ireland. July 20–25.

British Dental Association. Cambridge, England. July 30–Aug. 3.

Seventh Biennial Conference, Health Section of the World Federation of Education Associations. Tokyo, Japan. August 2–7.

Fourth International Pediatric Congress. Rome, Italy. September 24–30.

Second International Congress for the Protection of Infancy. Rome, Italy. October 4–8.

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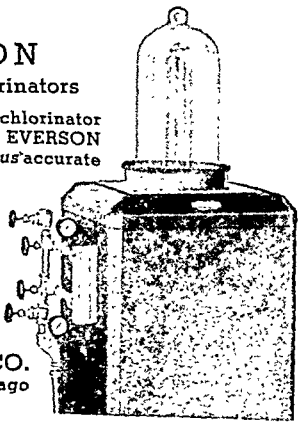
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Problem of the Subnormal in the Community

Vital Statistics at the Service of Public Health

Typhoid Carriers Among 7,000 Food Handlers

Staff Supervision in Public Health Nursing

Investigation of Source of Arsenic in a Well Water

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Maryland-Delaware Water and Sewerage Association
Michigan Sewage Works Association
Missouri Water and Sewerage Conference
New England Sewage Works Association
New Jersey Sewage Conference
New York State Sewage Works Association
North Carolina Sewage Works Association
Ohio Sewage Works Conference
Oklahoma Water and Sewage Conference
Pacific Northwest Sewage Works Assn.
Pennsylvania Sewage Works Association
Rocky Mountain Sewage Works Assn.
Sanitary Engineering Division of Argentine Society of Engineers
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The Canadian Institute on Sewage and Sanitation
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Physician, M.D., Medico Chirurgical, Philadelphia, 4 years' Army Medical Corps, 10 years' full time county health officer, 5 years' field experience in syphilis control; desires position as venereal disease control officer in a state or municipality which is seriously interested in the control of syphilis. A-284

Physician, M.D. University of Minnesota, with post graduate training in public health and experience as deputy and epidemiologist in large city department of health; will consider administrative position, communicable disease or venereal disease administration at salary not less than $4,800. A-287

Physician, M.D. University of Maryland School of Medicine, and C.P.H. Johns Hopkins University, nine years' experience as county and school health officer; desires position as director of a county or district with headquarters in a city. A-265

Physician, M.D. Loyola University, post graduate studies in bacteriology and medical sciences at University of Chicago, will consider position as a state or municipal health officer. Experience covers direction of health department laboratories and research and assistant commissioner of health of a large city. A-295

Young man, S.B. in biology and public health, Massachusetts Institute of Technology, post-graduate courses in health education, business administration and economics, desires executive position with official or non-official agency. Has been health officer of a city of 10,000 population for 9 years. A-296

Physician, M.D. Ohio State State University, C.P.H. Harvard School of Public Health, seeks position as health officer or epidemiologist. A-297

LABORATORY

Bacteriologist, B.S. Cornell University, desires position doing research or routine bacteriology. Experienced in bacteriology, hematology, serology, clinical pathology, etc. Recently completed one year's special research on streptococci in air pollution. L-299

PUBLIC HEALTH ENGINEER

Public Health Engineer, graduate of Massachusetts Institute of Technology, with B.S. in Public Health Engineering, desires position. Has served as assistant county and state sanitary engineer, and as assistant areal supervisor of occupational morbidity and mortality study, Office of Industrial Hygiene and Sanitation, U.S.P.H.S. L-283

CHILD HYGIENE

Pediatrician, graduate Columbia College of Physicians and Surgeons 1912, with excellent background of practical and administrative experience in large city health department, will consider position of teaching or administration in child hygiene. A-288

Young woman, M.D. Yale 1930, Dr.P.H. Yale, excellent background teaching and child hygiene administration, state and local, will consider an exceptional opportunity, preferably in the East. C-289

Physician, M.D. University of Iowa, with experience as state director of child hygiene and with a background of health education, has been full time city health officer and teacher in Class A medical school, is available for position paying $5,000 per annum. A-290

Woman physician, M.D. Creighton Medical School, with extensive experience in maternal, infant and child hygiene and special interest in crippled children's service, desires positon. Prefers Western or Central states. C-301

MISCELLANEOUS

Physician, M.D. Western Reserve University, M.P.H. Harvard, extensive experience in pediatrics and school medical service, also background of county health administration and teaching in Class A medical school, now employed, will consider expanded opportunity in teaching or research. M-302

Young woman, M.S.P.H. University of Michigan, experienced in laboratory research and health education, is available for research or investigative work. M-303

Experienced research microbiologist, Ph.D. Western Reserve University, will consider position in public health laboratory service or university teaching. M-291

Graduate, University of Michigan, M.S., experienced in Public Health Service health inventory, will consider administrative offer in a health department. M-292

Physician, M.D. Northwestern, Dr.P.H. Johns Hopkins, broad experience in laboratory, teaching and epidemiological fields, now engaged in Eastern department of public health, will consider part time assignments during first half of 1937. M-293

Young woman, Ph.D. Columbia University, splendid background of experience in health education, will consider position in Eastern states in university or promotional agency. M-294

Physician, M.D. Northwestern University, Ph.D. Johns Hopkins University, Dr.P.H. Yale University, is eager to secure general public health work, health center administration, infant welfare or epidemiology position. A-300

Where no other address is given excepting the key number, address your replies to the American Journal of Public Health, 50 West 50th Street, New York City, indicating clearly the key number on the envelope. Your replies will then be forwarded.

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SUPPLEMENT TO AMERICAN JOURNAL OF PUBLIC HEALTH,
VOL. 27, NO. 4, APRIL, 1937

The Educational Qualifications of the School Physician

Report of a Committee of the American Association of School Physicians

AMERICAN PUBLIC HEALTH ASSOCIATION
50 West 50th Street, New York, N. Y.

The Educational Qualifications of the School Physician*

THE rapid development of health programs in the public schools within the past several decades has created widespread interest among members of the medical and public health professions. Problems of school health and hygiene now engage the attention of approximately 2,000 health officers and school physicians in the United States and Canada. In a sense, the rapid growth of the American Association of School Physicians during the past decade attests to the interest which these professions have shown toward health problems in the public schools.

In the 41 years during which health officials in the United States and Canada have been professionally concerned with school health problems, very little has been done to prepare them for this field of public service. As a general rule anyone with a medical training and a liking for children was thought to be sufficiently well qualified to carry out the duties of a school physician. Wood [1] in 1912 was perhaps the first to call attention to the inadequacy of this conception. In an address delivered before the Sixth Congress of the American School Hygiene Association, he said, " Physicians require for this field of educational hygiene not only medical training and skill, but an understanding of educational principles and methods." Shortly thereafter, Burnham,[2] another pioneer in the field of school hygiene, stated, " The school physician should not be only a medical expert, but also an expert in school hygiene." These pronouncements in this field have been echoed repeatedly by other leading school hygienists.

Originally the school physician, or medical inspector as he is often designated, was interested primarily in problems of contagion. As the situation unfolded itself to him, however, inspection for the presence of physical defects was deemed of sufficient importance to justify his attention. In turn, problems of school sanitation, ventilation, lighting, exercise, rest, fatigue, posture, immunization against disease, abnormal behavior, and many others have been added to his responsibilities in the public schools. With the growth of the mental hygiene movement, the educator again turned to the physician for assistance; more recently the school physician has been invited to take an active part in the health education programs of the public schools and colleges. In order to become proficient in these many forms of service, it is apparent that additional training is required of physicians other than that which they ordinarily receive in the medical school.

New York State was the first one to require additional training, other than medical, of those physicians employed as full-time medical supervisors part of whose salaries was met by state aid. According to the require-

* Report of a Committee of the American Association of School Physicians.

ments [3] set up in 1928, full-time school physicians in that state, paid in part by state funds, were required to have the following qualifications:

1. Graduation from a medical school registered by the State Education Department, and licensed to practise medicine in New York State
2. One year of acceptance internship or 5 years of successful practice
3. Six semester hours of postgraduate work in a school or schools of medicine in such subjects and in such institutions as were approved by the State Commissioner of Education; the following subjects to be included in the instruction given:
 a. Medical examination of school children
 b. Psychiatric problems of school age
 c. Problems of growth and nutrition
 d. Preventable defects of eyes, ears, teeth, and posture
 e. School sanitation
 f. Communicable disease control
4. Six semester hours in postgraduate work in a school or schools of education in such subjects and in such institutions as were approved by the State Commissioner of Education. The following subjects were suggested:
 a. Principles of health education
 b. Organization and administration of health education in public schools

To meet the semester hours of medical requirements, courses of instruction were set up at the College of Physicians and Surgeons of Columbia University to insure the necessary training for those physicians choosing to enter this field. To date this is the only academic institution which offers a course of instruction specifically for the training of the school physician. However, other institutions, 12 in number, offer courses in public health and education which would be helpful to the physician contemplating a career in school health work. The University of Michigan confers the degree of Master of Science in School Health for those wishing to specialize in this field. This course of instruction, however, is open to all graduate students including physicians.

At present the State Department of Health of Massachusetts encourages school physicians to secure training [4] as follows:

1. Full- or half-time physicians should have in addition to some experience in general practice, either experience or training in public health work and an understanding of physical education, mental hygiene, and the principles of teaching, ability to handle children, tact, and administrative ability.
2. Part-time physicians should have the public health point of view, tact and the ability to handle children, and an appreciation of the importance of the educational aspects of their work.

This form of recommendation is quite typical of the qualifications set up by the other 15 states having mandatory legislation governing medical inspection.

In 1930 the Committee on the School Child of the White House Conference on Child Health and Protection advocated the following training of physicians for school health work:

> Physicians and other members of the school health service should understand and be in sympathy with the educational implications of the school health program. If not already included in their preliminary equipment, a course of training in service should be given to provide them with a reasonable amount of the philosophy and procedures of the educational program.
>
> The school physician should be a graduate of medicine and should possess good clinical judgment. It is desirable that he have some training in public health also. His personality should command the respect of both his professional associates and laymen.[5]

More recently Sundwall,[6] in a paper delivered before the fourth annual meeting of the American Association of School Physicians at Montreal, advocated a curriculum for the purpose of training physicians for the position of director of school health education. In this he included a fundamental training in public health and hygiene, courses in a school of education such as philosophy of education, history of education, school administration, psy-

chology of education, principles of teaching, and special training in methods and materials in health education, methods of teaching health, and school health problems. "No one will gainsay the statement," he says, "that a comprehensive and constructive school health education program can be forthcoming only when all the interests and activities in our public schools dealing directly with the health of pupils are correlated into one administrative unit, and directed by one who is adequately trained to do the job." A committee appointed at this same meeting with Dr. A. O. DeWeese as chairman, gave consideration to the recommendations made by the speaker, and shortly thereafter proposed the following general qualifications for school physicians in charge of health programs.

1. Training in education
2. Experience in teaching in the public schools or college
3. Training experience or contact in health education work in the public schools
4. A degree of M.D. with intern training
5. Administrative ability

The results of the study [7] conducted by the Joint Committee of the American Medical Association and the National Education Association during 1935 to ascertain opinions relative to desirable school health policies, also point clearly to the need for better trained school physicians. "It is encouraging to note," the report states, "that the general demand is for persons with broad professional training (physicians, dentists, and nurses), and for those who add to this professional preparation specific training and (or) experience in the field of child welfare and of school health administration . . ." Over half of the superintendents, parents, teachers, and school physicians consulted in this study advocated additional training other than medical for the school physician.

Evidence contributed by the American Child Health Association in still another study [8] recently made of school health methods in New York City offers additional proof for the need of systematized methods and better training of those doing school health work. "The school medical program as now conducted, is in general one of the least efficient of our public health procedures," writes Armstrong in an article commenting on this study. Emerson [10] sounds a similar warning in an article appearing in the January, 1935, number of the *School Physicians' Bulletin*. "No single official health service costs so much," he writes, "with so little evidence of accomplishment as that provided by health or educational authorities, or by the two combined, for the health protection of school children." Further, he states, "Once professional eligibility requirements for school physicians are established by state and local educational authorities, then physicians will seek, and schools of medicine and public health will offer, special courses to meet the requirements." These opinions and many others of a similar nature point out the necessity for a careful study of the educational qualifications of school physicians.

PURPOSE OF STUDY

Believing that a thorough investigation of the activities and interests of the school physician and medical inspector was in order, the present committee of the American Association of School Physicians has endeavored to secure answers to the following questions:

1. What opinions do leaders in school health work hold as to the training necessary for the school physician and school medical inspector?
2. What educational facilities are available for their training?
3. What are the present activities and in-

terests of school physicians and school medical inspectors?
4. What is the training of school physicians now in service?
5. What duties and training should the school physician have?

METHOD OF PROCEDURE

Because of the limitation of funds available for this study, it was thought advisable to confine the investigation to 4 procedures as follows:

1. A study of the literature relative to expressed opinions of leaders in the field of school health concerning the training of the school physician and school medical inspector
2. Correspondence with physicians and educators whose opinion would be of value in shaping the nature of the investigation
3. A study of the educational facilities in the United States and Canada which offer courses suitable for training the school physician
4. A questionnaire study of:
 a. Present interests and activities of school physicians
 b. Future interests and activities of school physicians (information obtained from school physicians, health officers, health educators, and physicians in academic institutions)
 c. The training of the school physician and school medical inspector (information obtained likewise from school physicians, health officers, health educators, and physicians in academic institutions)

FINDINGS

I. *Literature*—A thorough search of the literature revealed a dearth of material on the subject. Most of the significant references have been already dealt with in the introduction. These and others of significance have been included in the bibliography.

II. *Opinions of physicians and educators*—Some of the most interesting replies elicited from leading school physicians, health officers, and educators are as follows:

Many of the best things in modern education are going to be failures, may even be positively dangerous, unless school physicians are able to help direct educational and guidance policies, as well as they now handle communicable disease control. This is my considered judgment after 20 years of work in health education, teacher-training and school administration.

To this end school physicians must know modern education; they must also know social service and recreational assets of their communities; and above all, they must understand and share the psychological approach to human development.

From our experience, I think educational psychology, with tests and measurements, would be the most useful single course to offer to physicians in education. Student teaching comes next.

EDNA W. BAILEY, PH.D.,
Associate Professor of Education,
University of California

The problem of what curriculum will best train school physicians for their task is a very important and timely one and worthy of careful consideration. As an example of its importance we may point to some of the data in "Physical Defects—The Pathway to Correction." Part of the difficulties revealed in that report were due to the lack of training of the school examiners and part of them were due to methods of organization and the use of the physician.

SAMUEL J. CRUMBINE, M.D.,
Formerly Executive Secretary American Child Health Association

This matter is taken all too lightly by the vast majority of practising physicians, and I feel that those specializing in this branch of service must themselves act as the spearhead in ameliorating conditions. The first step is now being taken by your committee in elevating standards which in turn will lead to adequate postgraduate specialized education and clinical experience.

FREDERICK L. PATRY,
Psychiatrist, New York State Department of Education

The more I read articles written by dentists conducting school dental programs, the more I realize that educational and health authorities ought to set up qualifications for dentists participating in school health programs. As a matter of fact, the Advisory Council on Mouth Hygiene of New Jersey is now working on this question.

J. M. WISAN, D.D.S.,
State Supervisor, New Jersey Department of Public Instruction

We cannot expect any fully trained full-time school health administrators who are public health experts, educators, physical educators, psychiatrists, psychologists all rolled into one until boards of education pay a sufficient salary to allow sufficient time for the health director to acquire all this special training.

G. MORLEY SELLERY, M.D.,
Assistant Health Director, Los Angeles Public Schools, Los Angeles, Calif.

I do not believe we are ready to recommend any particular type of training or advise any special courses. The older type of school health service where the school physician assumed full responsibility for the health of the child is giving way to that where education of the child and coöperative action of the community are the major aspects. This calls for a working knowledge of the principles of education plus considerable ability in sociology.

DON W. GUDAKUNST, M D.,
Director, School Health Service, Detroit Department of Health,
Detroit, Mich.

The school physicians, both part-time and full-time, should hold a diploma in public health. Only with the highest possible training of the whole personnel of health departments and voluntary health agencies can we expect the best returns. But there is a great difficulty against our ambition to increase such training and this is the appointment of personnel by politicians.

J. A. BAUDOUIN, M.D.,
Professor of Hygiene, University of Montreal, Montreal, Canada

I think training should include at least a short course in all phases of school work, administrative as well as health. If the doctor has taught school he could probably better understand the viewpoint of the teacher. He should also have training in ways of handling school administrators, boards, etc.

CHARLES L. OUTLAND, M.D.,
Medical Director, Public Schools,
Richmond, Va.

Very few school physicians are really qualified to invade the teaching field, which demands skill and special training.

We can best serve the community by sticking to our medical calling, though we should study the allied health fields, and familiarize ourselves with the special areas where our interest and special knowledge can help us make a contribution.

As an administrator I view with respect an applicant for a position who demonstrates his interest in his chosen field by fitting himself by college and home study. We conduct training courses for our medical inspectors and nurses now in service, on a complete series of subjects, so that those who have not troubled to take public health courses previous to appointment, get them anyway. In addition to routine supervision of work done, our medical supervisors conduct quizzes periodically on diagnosis, on the official regulations, etc. We are continually trying to bring up the standards of the backward men. Halfway up the salary schedule, inspectors and nurses are halted in their increments, unless they complete certain education requirements, and receive satisfactory rating for their work.

DOROTHY CHILD, M.D.,
Special Assistant, Division of Medical Inspection, Public Schools,
Philadelphia, Pa

Training depends on scope of work assigned. The doctor should be a physician in fact as well as name—not a second-rate pedagogue or "social worker." The schools have a limited scope of proper function and a competency in getting results—which is less than is often claimed by educators themselves. This is admitted by their best representatives and should be kept in mind.

LE ROY A. WILKES,
Executive Secretary, Medical Society of New Jersey, Trenton, N. J.

The school physician's training should be intensified along the following lines:

1. Epidemiological procedures
2. School sanitation as concerns school buildings and environment
3. Immunization and its proper interpretation
4. Normal growth and development with particular attention being paid to the A.C.H. index, Dunfermline scale, and Pelidisi index
5. Psychology and mental hygiene
6. Educational guidance, personality tests, etc.

JOHN SUNDWALL, M.D.,
Director of Division of Hygiene and Public Health, University of Michigan, Ann Arbor, Mich.

These replies and many others of similar import serve to illustrate the diversity of opinion existing on this subject. To judge by numbers alone

one may readily conclude that there is a preponderance of opinion favoring additional training for the physician engaged in public school health work other than that received in the medical school. Just what the exact nature of this additional training should be, however, is not apparent from the opinions expressed.

III. *Educational Facilities* — Letters of inquiry were directed to 14 universities in the United States and Canada which offer training in public health for the purpose of ascertaining educational facilities for the training of school physicians. Only one institution, as already mentioned, the DeLamar Institute of Public Health of Columbia University College of Physicians and Surgeons, was found to offer a course of instruction specifically for the training of the school physician. The Division of Public Health at the University of Michigan offers courses leading to a Master's Degree in School Health. These may, however, be taken by either a layman or a physician. Other schools offer fundamental courses in public health; 3 have courses in hygiene. With one exception all schools consulted in this inquiry expressed an interest in the development of a course of instruction for the school physician.

IV. *Questionnaire Study*—A fourth approach to the problem consisted of a questionnaire study by which knowledge was sought of the professional duties and responsibilities of school physicians in service, and from those indirectly associated with school health programs as health officers, and educators.

Three hundred and ninety-four questionnaires were sent to health officers, school physicians, and educators in the United States, and 11 to school medical officers and educators in Canada, or a total of 405 in all.

Of this number, 128, or 31 per cent, have been returned (Table I). Replies have been received from physicians and educators from 30 states in the United States and 2 provinces in Canada. Among the 128 who replied, there were 98 school physicians, 16 health officers spending part of their time on school work, and the remaining 14 included health educators, state supervisors of school health, college physicians, and other specialists in public health.

TABLE I

Types of Health Workers Replying to Questionnaire

Position Held	*No.*
School Physician	
a. Private school	2
b. Public (full-time)	
1. Urban, head of department	42
2. Rural, head of department	1
c. Public (part-time)	
1. Urban, head of department	25
2. Urban, assistant	10
3. Rural, head of department	3
Health Officer (school) Physician, inclusive	
a Full-time	
1. Urban, head of department	6
2. Rural, head of department	4
3. Urban and rural department	6
School Cardiologist	1
School Phthisiologist, state supervisor	1
Professor of Hygiene	1
Professor of Health Education	1
Professor of Public Health Practice	1
Supervisor, health education, State Department of Education	3
Director, Bureau of Communicable Disease and Rural Hygiene	1
Director, Health and Physical Education, State Department of Education	1
Health Educator	7
Director of Health Education, American Medical Association	1
Director, College Health Program	1
School Psychiatrist, State Department of Education	1
Health Director, Teachers College	3
Health Director of Rural School Health Programs	1
School Otologist	1
Others	4
Total	128

In all, 98 school physicians replied; 16 health officers doing school work part-time; the remaining 14 consisted of health educators, state supervisors of school health, college physicians, and other specialists in public health.

By what department are you em-

ployed? Education, Health, or both? Other?—One hundred and fourteen of the school physicians answered this question. The vast majority, 75 in number, or 65 per cent, were employed by boards of education; 16, or 14 per cent, were employed by boards of health; in 14 instances, 12 per cent, the physician was employed by both education and health authority. Private educational organizations accounted for 4, or 3 per cent; 5, or 4 per cent, were employed as college physicians.

Duties of School Physicians: For the 107 school physicians answering the question as to their duties, the following list gives the services most commonly rendered and recognized as appropriate for a school health service:

1. Routine examination or inspection of children in specified grades
2. Special examinations of children referred by nurse or teacher
3. Sanitary inspection of buildings and grounds
4. Certification of children returning to schools after absence
5. Examination of children returning to school after absence
6. Classroom inspection for communicable disease
7. First aid

Health talks to parents, teachers, or pupils were mentioned by over 50 per cent.

Fifty-three, or approximately 50 per cent, carried out immunization against smallpox, diphtheria, or both, in the schools.

Weighing and measuring, testing hearing and vision, and home visiting were carried out by 49.6 per cent of physicians. Approximately 20 per cent delegated this to school nurses.

Examination of teachers and custodians were carried out by 47 per cent of those replying.

Sixty-one, or 57 per cent, conducted clinics of various kinds in association with their work.

Interest in the activities of the school physician was purely one of finding out the frequency with which certain activities are carried out.

Answers to the question as to the grades in which children are routinely examined or inspected showed wide variation. Of the 99 school physicians answering this question only 50 per cent paid special attention to the lower grades. No correlation could be shown between the combination of grades examined and the size of the school population. In all there were 37 different grade combinations mentioned, ranging from examination of the children of only one grade to routine examination of those of every grade from kindergarten to the 12th grade. Twenty-five per cent of the rural school physicians and 22 per cent of those of city schools reported examination of children of all grades. In only two instances was the examination limited to children of one grade (the 10th) in schools of 2 cities of 10,000 to 25,000 population. In 3 city schools the examination was made of children in 3 grades, 1st, 4th, and 7th.

Thirty-five additional duties were mentioned ranging from "holding an annual health week" to "consultation on cases of suspected mental disease." The most common duties mentioned were:

1. Examination of pupils participating in athletic contests
2. Examination of all new students

City School Physicians' Salaries:

a. Twelve Month Employment Period —Ninety-eight physicians (85 per cent) reported this item. For the full-time city school physicians the salaries ranged from a maximum of $7,500 to a minimum of $2,400, with an average of $3,786. In most instances the larger salaries were received by individuals in large city health departments, who in addition to being in charge of school health work, had such titles as Health

Commissioner, or Deputy Health Commissioner.

Salaries:

a. Rural full-time school physicians received a maximum of $4,800 and a minimum of $2,350, with an average of $3,575. With one exception these were health officers doing school health work as a part of their regular duties.

Salaries for school physicians doing school health work in both urban and rural areas were comparable to those of the rural school physicians.

Of the 4 part-time school physicians reporting this item, the maximum salary received was $2,250, and the minimum $240.

b. Nine or Ten Month Employment Period—The full-time urban school physicians working over a period of 9 or 10 months, received salaries ranging from $6,500 to $1,650, with an average of $3,075.

Of the urban part-time school physicians reporting this item, the salaries ranged from a minimum of $180 to a maximum of $3,200, with an average of $1,078. The majority received salaries under $1,500.

One rural part-time school physician received a fee of $.75 for the examination of each pupil. Two others doing both rural and urban work received salaries below $1,500.

Supervisory Duties:

Of the 106 school physicians answering the question as to their responsibility for supervision of the school health program, 96 per cent of the full-time school physicians, and 76 per cent of those on part-time replied that they had supervisory duties, while 4 per cent of the full-time and 24 per cent of the part-time school physicians indicated they were without supervisory duties.

Administration: Sixteen per cent of the 103 physicians replying to the question as to their administrative relation to the superintendent of the school or schools, stated that they were assistant superintendents in charge of the school health program; 68 per cent replied that they acted as general adviser to the superintendent; and the remainder stated that they had little or no direct relationship with the superintendent.

It is encouraging to see that some physicians are included in the school organization on a par with other administrative officers.

Consultant Relationship: Sixty-six per cent of physicians replying to the question as to consultant contact with the superintendent stated that they had frequent consultation with the school superintendent. Twenty-three per cent had infrequent consultations; and 9 per cent replied that they had slight or no contact.

One hundred and three replies were made by school physicians to the question as to their administrative consultant relationship to the physical education program. Seventy per cent stated that they acted as adviser to the physical educator, while 19 per cent had no administrative relationship.

Relation to Physical Educator: Forty-seven per cent replied that they had frequent conferences with the physical educator regarding health problems affecting his program; 36 per cent stated that they had infrequent conferences; and 16 per cent had slight contact.

Nine per cent replied that they were in charge of the physical education program; 74 per cent made special recommendations as the occasion demanded; and 15 per cent had little or no relationship to the physical education program.

Relation to Health Instruction: One hundred and eleven, or 97 per cent, of school physicians replied to the question as to their relation to the program

of health instruction. Twenty-one, or 31 per cent, of the full-time school physicians, replied that they had supervision of the health instruction program; 36 per cent assisted in the preparation and maintenance of courses in health education; 4 per cent maintained a course of instruction for teachers; and the remainder had no relation to the health education program.

Of the part-time school physicians replying to this question, 13 per cent stated that they had supervision of the health instruction program: 31 per cent assisted, while in 1 instance the school physician taught a course in health education. The remainder, 52 per cent, had little or no relation to the health education program.

These replies may be taken to indicate that school physicians, particularly those employed on a full-time basis, are expected to contribute actively to the health education program, thus emphasizing the need for better understanding and preparation along this line (Table II).

TABLE II

Relation of School Physician to Program of Health Instruction

	School Physician			
	Part-time		*Full-time*	
Health Instruction	*Number*	*Per Cent*	*Number*	*Per Cent*
Supervision of health instruction program	6	13	21	31
Assists in preparing and maintaining course	14	31	24	36
Teaches course in health education	1	2	0	0
Maintains course of instruction for teachers	0	0	3	4
No relation	16	35	9	13
Not designated	8	17	9	13
Total	45	100	66	100

Special Training: Fifty-one per cent of the 111 full-time physicians replying to the question as to the place and content of any special training for school health work, replied that they had had extra training other than medical. Over 25 per cent had had courses in public health, school hygiene and sanitation, health teaching, principles of teaching, physician education, public health administration, physiology of child growth and development, vital statistics, psychology of education, public speaking, and child hygiene. This training was received in 22 different institutions. Sixteen failed to designate the institutions where they had received their training. Columbia ranked first in attendance, Johns Hopkins second, Harvard third, and Massachusetts Institute of Technology and the University of Michigan fourth. Time spent in training ranged from 1 month to 4 years.

Experience: Ten, 11 per cent, replied that they had experience in school health work ranging from 4 to 25 years.

Twenty-three, 27 per cent, replied that they had no training other than regular medical.

Of the 48 part-time school physicians replying to this inquiry, 13, 27 per cent, replied that they had extra training other than regular medical. Over 20 per cent had training in public health, school hygiene, principles of teaching, physiology of child growth and development, public speaking, and pediatrics.

Courses of training ranged from 2 to 12 months in duration. Eight failed to state the length of their training.

Seven, 14 per cent, stated that they

TABLE III

The Opinions of 123 School Physicians, Health Officers, Health Educators, Relative to What the Duties of the School Physician Should Be

Suggested Duties	Answer Given: Yes No.	Yes Per Cent	No No.	No Per Cent	Discussion No.	Discussion Per Cent
a. When more than one physician is employed one should act as supervisor	109	88	7	5	7	3
b. Determination of policies of school health program (all aspects)	86	69	13	10	24	19
c. Should act in advisory capacity to the superintendent	109	88	11	9	3	2
d. Should administer all types of health service and health education in the school	76	61	26	21	21	17
e. Should make regular examinations of children in specific grades	103	83	7	5	11	9
f. Should make special examinations as found necessary	113	91	6	4	4	3
g. Should make examinations of teachers and custodians	78	62	21	17	24	20
h. Should make sanitary inspection of school buildings and grounds	97	78	18	14	8	6
i. Should make daily visits to schools in time of an epidemic	94	76	12	10	17	13
j. Should make examination of children between 14 and 16 asking for work certificates	97	79	18	14	8	6
k. Should make inspection of children entering school after absence from communicable disease	90	73	10	8	23	18
l. Should hold regular office hours for consultation with parents	87	70	18	14	18	14
m. Should hold regular meetings with the teachers	81	65	28	22	14	11
n. Should be in a supervisory position in relation to physical education, home economics (health aspects), and special classes for the handicapped	85	69	16	13	22	17
o. Should make out monthly and annual reports	100	81	13	11	10	8
p. Should do immunization and vaccination	38	30	32	26	53	43
q. Should do some research each year	83	66	27	21	13	10
r. Should either conduct intelligence tests, personality tests, behavior studies, or supervise work of those delegated to do this work	57	46	35	28	31	25
s. Should supervise courses in health instruction	93	75	11	9	19	15
t. Should conduct classes in health instruction for teachers and assist teachers conducting courses for pupils	78	63	23	18	22	17
u. Should supervise education of physically and mentally handicapped children	77	62	21	16	25	21

had experience in school health. This ranged from 2 to 25 years.

Twenty-eight, 58 per cent, had only medical training.

Functions Appropriate for School Physicians: There was great diversity of opinion among the 123 school physicians, health officers, and educators as to the functions appropriate for the school physician. Tabulation of the 21 duties concerning which opinions favorable or otherwise were most commonly expressed gives the results shown in Table III.

Fifty-three, or 41 per cent, of those answering the question as to duties suitable for the school physician suggested a total of 47 additional duties or responsibilities other than the 21 listed above. Those receiving most emphasis included the following:

1. Encourage rapport with family physician, allied social agencies, Parent-Teacher Association, through public health education
2. Examination of candidates for athletic activities
3. Train teachers and nurses in the art of detecting signs of gross physical defects by demonstration, individual advice and conference
4. Grant excuses from gymnasium work

Training Considered Desirable: The question as to desirable training for

school physicians and medical inspectors was answered by 93, 81 per cent, of the school physicians, medical inspectors, and health officers replying to the questionnaire.

Eighty-five, 91 per cent, recommended training in school medical work for the full-time school physician. Topics recommended in order of their importance as expressed by the numerical frequency of their mention in the replies were: school sanitation, epidemiology, pediatrics, physiology of child growth and development, public health, school health problems, nutrition, mental hygiene, and health administration. Each of these was recommended to be included in the training of school physicians by more than 62, 65 per cent, of those answering the questionnaire. Over 50 per cent of those who answered this question recommended that the training of the part-time school physician should include the same topics.

All of the 17 health educators and others not directly engaged in school health work who replied to the questionnaire answered this question. Their opinions were almost identical with those expressed by school physicians. All 17 recommended training in school medical work and nutrition for the full-time school physician. Over 75 per cent recommended training in public health, school medical work, health administration, mental hygiene, principles of teaching as applied to health education, physiology of child growth and development, nutrition, public speaking, school sanitation, pediatrics, epidemiology, psychiatry, and school health problems.

Courses considered by this health educator group to be necessary for the training of the part-time school physician were in most respects identical with those advised for full-time school physicians; physical education and health statistics being the only other topics not included in the list for full-time school physicians.

Other courses suggested for the training of the school physician (both full- and part-time) were in order of apparent importance given, as follows: sociology, abnormal, social and experimental psychology, economics, orthopedics, physical fitness tests, philosophy of social service, hygiene of adolescence, speech correction, sight conservation, and training in the teaching of sex hygiene. One school physician made a commendable suggestion. It was his opinion that whenever a training course for school physicians was given, a period of observation should be arranged for during the course in some educational or health center with opportunity to observe an efficient school health program.

Source of Replies: The geographic distribution of the cities, counties, and institutions of higher education from which the replies to the questionnaire were received included 28 states of the United States and the provinces of Quebec and Ontario in Canada. One hundred and thirteen different communities, educational institutions, or official agencies were represented among the answers, 17 of the replies having been received from persons in 14 different places in New York State, 11 from as many different places in Michigan, 9 each from Illinois, Massachusetts, and Pennsylvania, 8 from New Jersey, and 9 replies from 6 separate places in California. In the case of 13 states, 1 or more replies came from only 1 city or public service. From Quebec 3 replies were received and from Ontario 1.

SUMMARY

1. *Literature*—A survey of the literature revealed evidence from widespread sources favoring special training and

requirements for the school physician and school medical inspector.

2. *Correspondence*—For the most part correspondents were inclined to favor additional training for the school physician other than that received in the medical school. Differences of opinion exist only as to the extent of the training necessary. Some also expressed the objection that present salaries paid to school physicians did not permit the expense of additional training.

3. *Educational Facilities* — Columbia University was found to be the only university offering a course of instruction specifically arranged for the training of the school physician. A survey of subjects offered at the various institutions revealed that the majority offer courses in public health and education; 4 offer courses in school hygiene and health education. With 1 exception, the directors of public health in all schools of public health consulted in the inquiry expressed an interest in the curriculum proposed as a basis for discussion.

4. *Employers of School Physicians*—The majority of school physicians consulted stated that they were employed by boards of education.

5. *Present Duties of School Physicians*—The replies of 50 per cent of the 107 school physicians answering the question as to their duties may be summarized as follows: duties included in almost all instances routine examination or inspection of school children, special examinations, sanitary inspections of buildings and grounds, health instruction of children and parents, immunization against smallpox and diphtheria, certification of children returning to school after an absence due to illness, examination of children applying for work certificates, testing hearing and vision, preparation of reports, classroom inspections for communicable diseases, and first aid. Thirty-five additional duties were mentioned, the most common of which were: examination of athletes, and certifying to excuses from physical training.

Of particular interest was the information relative to the grades in which children were examined as a routine. Eighty-nine physicians replying to this question stated that they examined various grades ranging from kindergarten only, to all 12 grades and the kindergarten; the varieties in practice being expressed in not less than 37 grade combinations. There was found to be no correlation between the grades examined and the size of the school population.

6. *Salaries*—Those school physicians giving full-time service received an average salary of $3,786 in cities, and $3,575 in rural area. Those receiving the higher salaries held such titles as deputy health commissioner or director of another division of a health department. The majority of part-time school physicians received salaries under $1,500, the highest salaries being received by those having specialized training.

7. *Supervision of School Health Programs*—The majority of the physicians answering this question indicated in their replies that they had no supervisory duties.

8. *Relation of the School Physician to Superintendent of Schools*—The majority of physicians indicated that they acted in the capacity of general adviser to the school superintendent. It is encouraging to note that of the 59 full-time school physicians replying, 7 stated that they had the title of assistant superintendent for the school health program. Frequent consultations were had with the superintendent by most physicians replying to the questionnaire.

9. *Relation of School Physician to*

the Physical Education Program—The majority of school physicians stated that they acted in the capacity of adviser to the physical educational department. This advice usually took the form of special recommendations following health examinations of school children. Frequent conferences were held by most school physicians with the physical education director.

10. *Training for School Health Work*—Approximately 50 per cent of the full-time school physicians replying to the questionnaire had obtained additional training beyond that received at the medical school, to fit them for their work in the schools. Over 25 per cent had taken courses of instruction in public health, school hygiene and sanitation, health teaching, principles of teaching, physical education, public health administration, physiology of child growth and development, vital statistics, psychology of education, public speaking, and child hygiene. Since these replies represent a cross-section of school physicians' training over the entire country, it can be taken as an indication of the trend of the times. This information has been indispensable to the authors of this report in forming their opinion as to the course of training which school physicians should have.

As would be expected, part-time school physicians had comparatively less training. It is of decided interest to know that over 20 per cent, however, had received training in public health, school hygiene, principles of teaching, physiology of child growth and development, public speaking, and pediatrics.

11. *Duties of School Physicians*—The opinions expressed by those who answered the questionnaire reveal the need for more careful study of the interests and activities of the present-day school physician. As might be anticipated, these differed widely on such procedures as immunization by the school physician, the carrying out of personality tests and behavior studies, examination of teachers and custodians, and health instruction by the school physician. Of special interest was the almost general acceptance of the principle that the school physician should be especially trained for his work.

Opinions relative to additional duties other than the 21 basic responsibilities suggested in the questionnaire point unmistakably to a wider concept of the function of the school physician than has generally been held by educational authorities or by school physicians. A total of 47 additional duties were mentioned in the answers to the questionnaire, thus indicating the need for further research in this direction.

13. *Opinions of School Physicians Relative to Their Training*—It is clearly evident that school physicians are well aware of the need for additional training other than that received in the curriculum required for the degree of doctor of medicine. Over 65 per cent replying to the questionnaire made the recommendation that additional courses of instruction be made available for the full-time school physician.

14. *Opinions of Health Educators Relative to the Training of School Physicians*—Close agreement was obtained from health educators with opinions expressed by school physicians as to the training of the school physician. The educators, however, were inclined to place more emphasis on specific training in educational problems and procedures.

CONCLUSIONS

1. A majority of the members of the medical profession engaged in school health work have adapted themselves to this newer specialty of medicine and public health by taking additional training in schools of medicine, public health, and education.

2. While there is considerable difference of opinion as to the specific rôle and duties of the school physician, there is fundamental agreement on certain basic activities.

3. Since both the literature referred to and the correspondence with leaders in the field of school health work show general agreement on the necessity of courses of instruction for school physicians, it is only logical that steps in this direction be favored.

RECOMMENDATIONS

On the basis of the findings of this study. the committee recommends that the following subjects be included in courses of instruction planned for the training of the school physician:

SUBJECTS IN WHICH TRAINING IS RECOMMENDED FOR THE SPECIAL TRAINING OF THE SCHOOL PHYSICIAN

1. Community Health Problems
2. School Medical Problems
3. Public Health Administration
4. Mental Hygiene
5. Physiology, Child Growth and Development
6. School Sanitation, Epidemiology
7. Pediatrics
8. Psychology of Education
9. Health Statistics
10. School Administration
11. Principles of Physical Education
12. Principles of Teaching, Methods and Materials in Health Education

MINIMUM LIST OF SUBJECTS NECESSARY FOR THE TRAINING OF A SCHOOL PHYSICIAN

1. Community Health Problems
2. School Medical Problems
3. Physiology, Child Growth and Development
4. School Sanitation, Epidemiology
5. School Administration
6. Principles of Physical Education

ADDITIONAL SUBJECTS SUGGESTED AS VALUABLE, BUT NOT INDISPENSABLE

1. Nutrition Work in Public Schools
2. Psychology of Education
3. Philosophy of Education
4. History of Education
5. Public Speaking
6. Child Psychiatry
7. Vocational Education
8. Practice Teaching

ACKNOWLEDGMENTS: The authors are indebted to the staff of the American Child Health Association for many suggestions relative to the nature and content of the study.

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To the many individuals who gave so freely of their time, the authors express their sincere appreciation and thanks.

NOTE: The original replies to the questionnaire and the tabular analyses of these are in the hands of Dr. Kleinschmidt, the chairman of the committee, and will be made available to students of this problem on request.

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VITAMIN REQUIREMENTS OF MAN

II. VITAMIN D

● The quantity of vitamin D required by an individual is influenced by such factors as environment, race, age, mineral content of the diet, and possibly by the source of the vitamin. Deficiency is manifest in children as rickets and decreased calcium retention, and in adults by the less well defined condition known as osteomalacia.

The minimum daily intake which will prevent rickets in infants is probably between 135 and 400 International units of vitamin D as supplied by cod liver oil (1). The optimum prophylactic dose is probably in the neighborhood of 1000 International units (2). It is also interesting to note that the League of Nations Technical Commission has recommended a daily intake of 340 International units of vitamin D for pregnant and lactating women (3).

Irradiated pasteurized milk containing 135 International units per quart and irradiated evaporated milk of the same potency have been found equally effective in preventing rickets in infants. The pediatrician will be interested in the following summary taken from a recent review:

> "Such evidence as is available may be interpreted to show that cod liver oil, cod liver oil concentrate milk, and irradiated milk are of equal potency for the human being, unit for unit." (1-b).

Other than the above recommendation for vitamin D intake during pregnancy and lactation (3), little definite information is available upon which to establish minimum vitamin D requirements of the human after infancy (1), yet while sunlight produces the anti-rachitic factor, most common foods are known to be deficient with respect to vitamin D (4). However, certain foods such as eggs, butter, liver and sea foods do supply this vitamin. The importance of sea foods, especially canned salmon, as carriers of vitamin D has been definitely established. A recent report on the vitamin D content of different varieties of canned salmon gave a value of 1.9 International units per gram for the least potent brand and 6 or more units per gram for several other brands (5).

From a consideration of the vitamin D values of salmon oil, the oil content of canned salmon and the quantity of canned salmon consumed annually in this country, it has been concluded that there is more vitamin D in the canned salmon sold in this country than in the cod liver oil used for both human and animal feeding (6).

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(1) a. 1937. J. Am. Med. Assn. 108, 206
b. 1936. Ibid. 106, 2150
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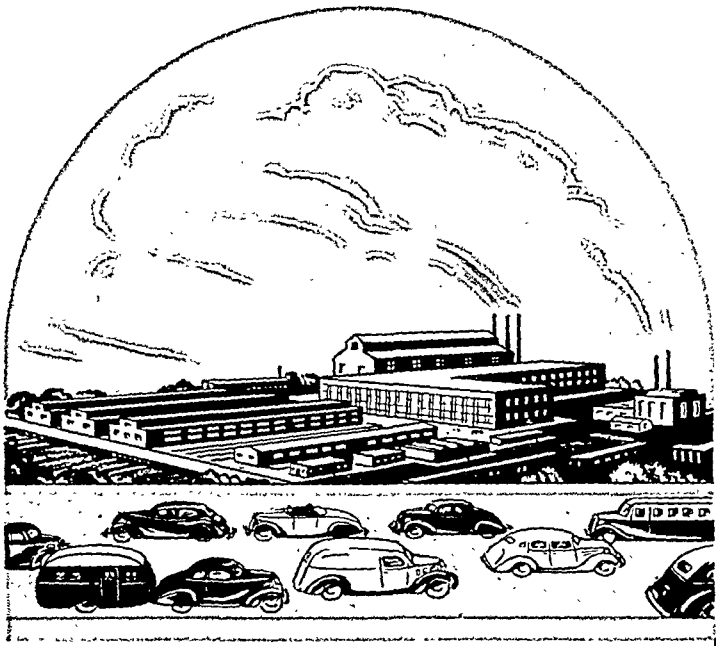
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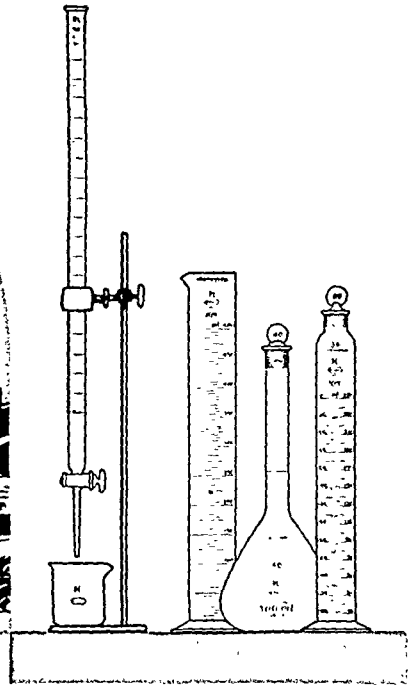
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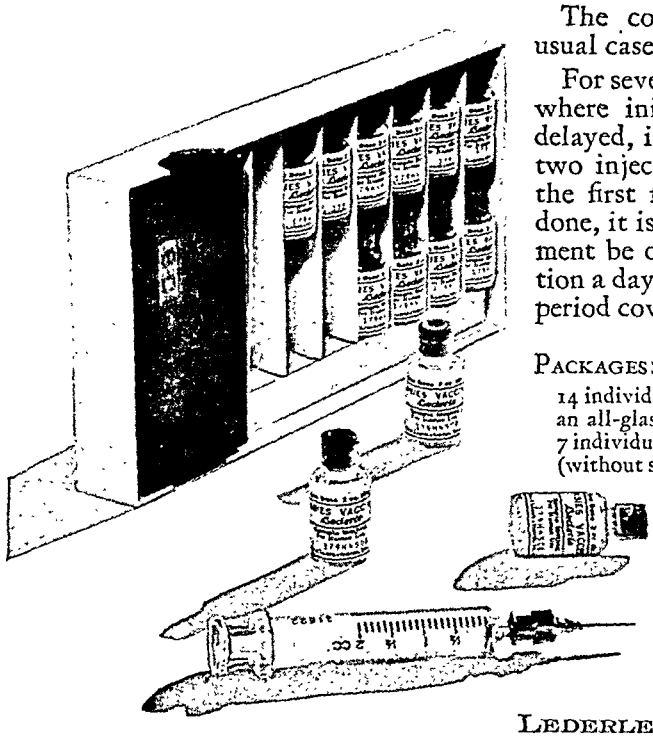
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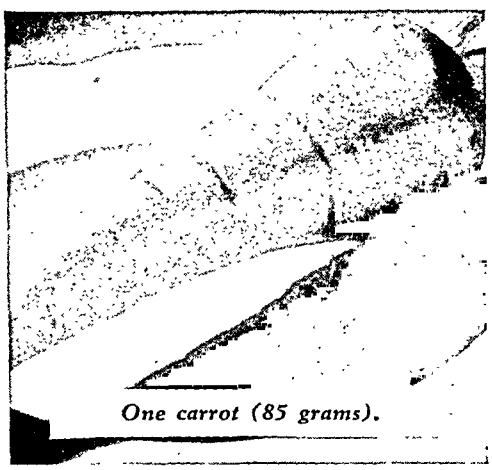
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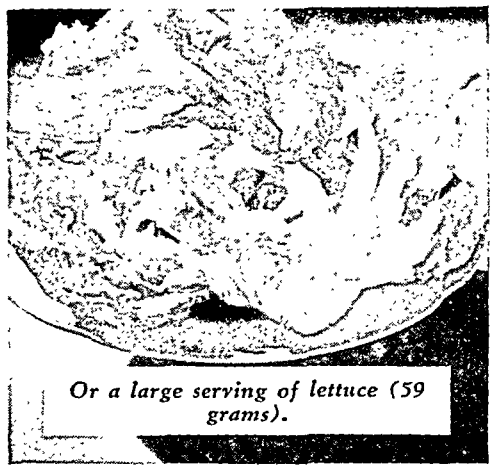
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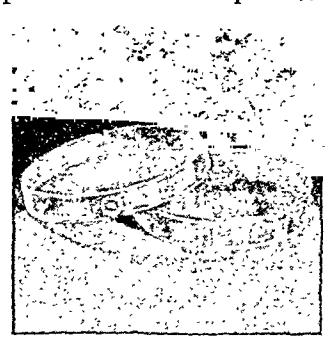
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Society	*Secretary*	*Place and Time of Annual Meeting*
Connecticut Public Health Assn.	Ira V. Hiscock	May, 1937
Florida Public Health Association	S. G. Thompson, D.P.H.	Tallahassee, Fla., December, 1937
Georgia Public Health Association	M. E. Winchester, M.D.	To be announced
Massachusetts Public Health Assn.	G. Donald Buckner, S.B.	To be announced
Michigan Public Health Association	Marjorie Delavan	Lansing, Nov. 10–12
Missouri Public Health Association	Dr. C. F. Adams	To be announced
New Mexico Public Health Assn.	Paul S. Fox	To be announced
Northern California Public Health Association	Dr. I. O. Church	To be announced
Ohio Federation of Public Health Officials	W. D. Bishop, M.D.	Columbus, November, 1937
Pennsylvania Public Health Assn.	J. M. J. Raunick, M.D.	To be announced
Public Health Association of New York City	Frank Kiernan	To be announced
South Carolina Public Health Assn.	Laura Blackburn	Myrtle Beach, May, 1937
Southern California Public Health Association	R. L. Kaufman, M.D.	To be announced
Texas Public Health Association	P. A. Kerby	El Paso, October, 1937
Virginia Public Health Association	B. B. Bagby, M.D., Pres.	To be announced
West Virginia Public Health Assn.	Dr. Edwin Cameron	October, 1937
Southern Branch, American Public Health Association	G. Foard McGinnes, M.D.	To be announced
Western Branch, American Public Health Association	William P. Shepard, M.D.	To be announced

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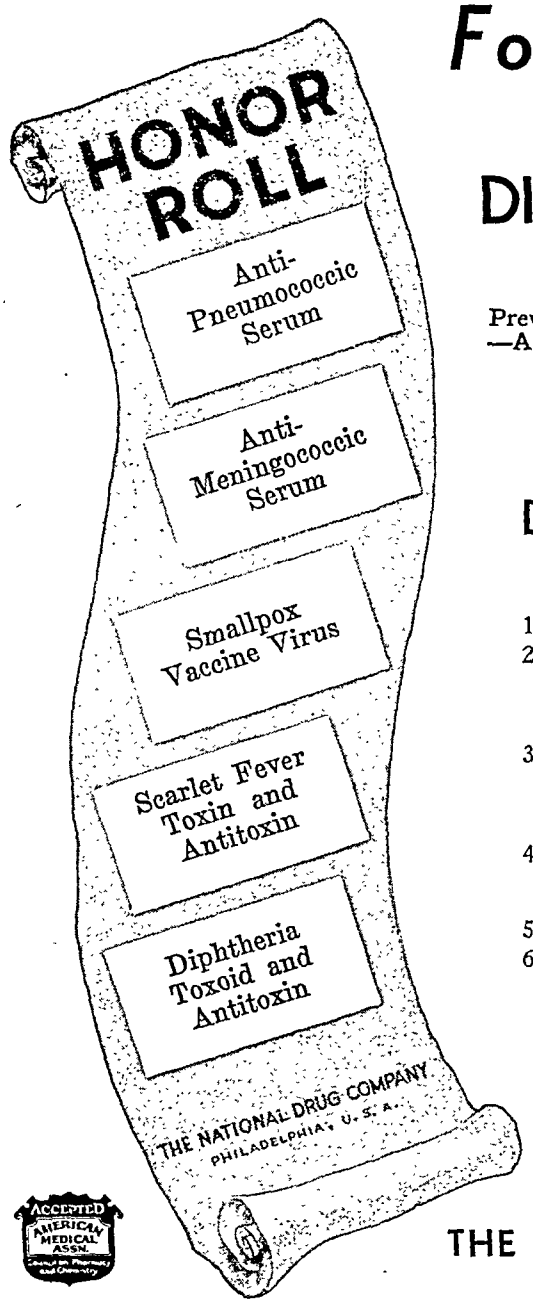
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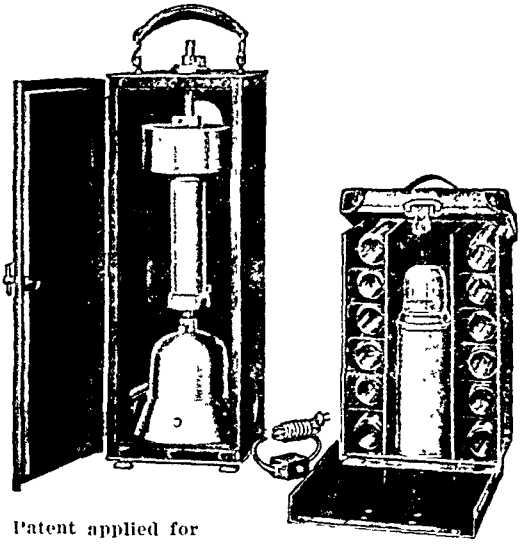
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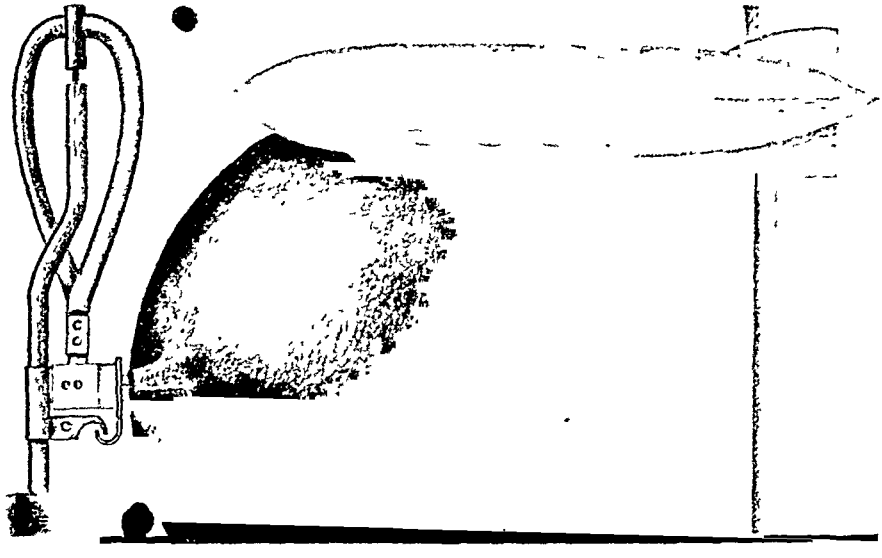
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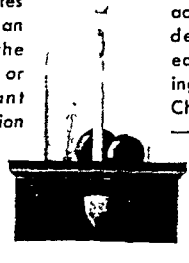
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Obstacles and Aids to Communicable Disease Nursing*

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THE prevention, control, and care of communicable diseases is admittedly one of the major health problems confronting health workers and the public today. It calls for the most skillful and complete coöperation between the medical profession, health officers, school physicians and teachers, nurses, hospitals, and laymen. If all of us work together on a plan, there is no reason why we cannot meet this urgent need in the public health movement, which up to the present has been largely passed by.

If we consider the number of deaths and the estimated number of cases from the 4 common communicable diseases of childhood, we are faced with the seriousness of our task. According to the mortality reports of the Bureau of the Census, the number of deaths in the United States in one year (1934) was:

Diphtheria	4,159
Scarlet fever	2,524
Whooping cough	7,518
Measles	6,986
Combined total	21,187

It is estimated that this number of deaths represents approximately 3,000,000 cases of sickness. But that is not the whole story. We must add the aftermath of heart disease, tuberculosis, blindness, deafness, and other sequelae. We are dealing often with very sick children and those who may suffer serious consequences for years.

On a recent field trip across the country, I asked some 20 city health officers if public health nursing is important in communicable disease service. There was unanimous and emphatic assertion that it is not only important but essential, although as yet we seem not to have developed statistical means of proving it in figures. We have, however, a strong statement based on facts in *A Survey of Communicable Disease Hospital Needs*.[1]

* Read before the American Association of School Physicians and the Health Officers and Public Health Nursing Sections of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 22, 1936.

The outcome of these diseases, especially in infants and children of preschool age, is more likely to be favorable under good home care than it is in the hospital. . . . When home quarantine is not possible, hospital care becomes mandatory; when conditions for home care are unsatisfactory, or when the infection is unusually severe, or when complications, especially of a surgical nature, arise, hospital care offers the better prospect. Among the conclusions are: The home care of acute communicable disease utilizing competent, organized visiting nurse services, demonstrates an effective and economical method for the control and care of contagion. The adoption by the city of the policy of home nursing care for suitable cases, in addition to hospital care, should result in material improvement in the control of contagion within the home and in lowered mortality.

Granting that public health nursing is essential in combating a major health hazard, let us see to what extent it is meeting the problem. Table I shows the number of communicable disease cases and visits reported by 84 cities in the City Health Conservation Contest of 1935. Some of these visits were made by physicians, though the majority were made by public health nurses. Few of these visits were concerned with bedside care. They were the usual inspection and instruction visits made to effect quarantine and to avoid spread of disease.

TABLE I

Communicable Diseases

Number of Cases and Visits Reported by 84 Cities—City Health Conservation Contest—1935

Disease	*Cases*	*Visits*
Diphtheria	2,968	26,964
Scarlet Fever	36,429	178,013
Whooping cough	31,557	81,472
Measles	146,398	344,893
Total	217,352	631,342

From Table I we are able to get the average visits per case as reported in the City Health Conservation Contest.[7] As these figures are for the most part visits by health department nurses who do not give bedside care, it is of interest to compare them with corresponding figures of the Metropolitan Life Insurance Company nursing service, which is chiefly a bedside care service. This comparison is made in Table II.

TABLE II

Communicable Diseases

Average Visits per Case

Disease	*City Health Conservation Contest—84 Cities*	*Metropolitan Life Insurance Company Nursing Service*
Diphtheria	9.1	6.4
Scarlet fever	4.9	8.3
Whooping cough	2.6	4.9
Measles	2.4	4.6

As might be expected, the number of visits per case is higher when bedside care is included, with the exception of diphtheria.

Is the number of visits reported in the City Health Conservation Contest adequate? The number of visits should probably be twice as many, if bedside service is included, judged by the experience of the Metropolitan Life Insurance Company nursing service in this field as presented in Table II.

Another picture showing the extent of skilled nursing care for communicable disease is presented from the mortality records of the Metropolitan Life Insurance Company for the year 1935. The company is eager and willing to pay for this service to its acutely ill policy holders, either through its affiliation with visiting nurse associations or through its own nurses.

An analysis of the company's mortality records for communities in the United States (excluding Pacific Coast Territory) in which Metropolitan nursing service was available is given in Table III.

TABLE III

Nursing Communicable Diseases
Per cent of Fatal Cases Reported for Nursing to Metropolitan Life Insurance Company Visiting Nurse Service—1935

Disease	Deaths of Metropolitan Policy Holders in Communities with Metropolitan Visiting Nurse Service	Reported to Metropolitan Visiting Nurse Service		Died in Hospital
		Number	Per cent	Number
Diphtheria	269	36	13	31
Scarlet fever	322	54	17	41
Whooping cough	321	81	25	31
Measles	301	64	21	44
Combined	1,213	235	19	147 or 12%

Presenting these data in pictorial form gives us a more vivid illustration of the present lack of bedside nursing care for communicable diseases.

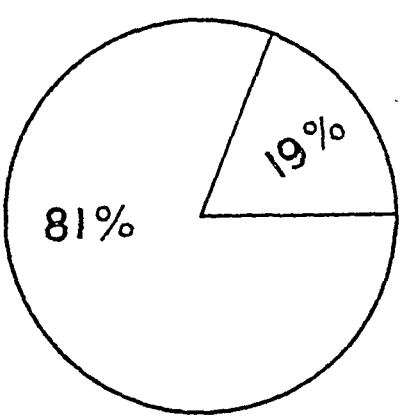
The significance of the figures in Table III and Chart I is that of the children with communicable diseases who died, 81 per cent had no nursing care through Metropolitan nursing service. We do not know what other nurses were visiting these cases, but it is reasonable to suppose that they were health department or school nurses who do not give actual nursing care. However, of the total number, hospitals gave care to 12 per cent. Potentially, then, we are failing to provide bedside care to 8 out of 10 children who die of communicable diseases. In the general population, I fear that the nursing facilities of the community fail to reach even a larger percentage of sick children.

At present, acute communicable diseases of childhood account for 8 per cent of the nursing case load of the Metropolitan Life Insurance Company, but in view of the mortality record and what is generally known about morbidity, this is still far below what it should be.

At this point we should consider

CHART I

Need for Nursing of Communicable Diseases
Diphtheria—Whooping Cough—Scarlet Fever—Measles



Cared for by Metropolitan Visiting Nurse Service

Not cared for by Metropolitan Visiting Nurse Service

Data from Mortality Records Metropolitan Life Insurance Company—1935

what the function of the public health nurse is in communicable disease service. This is summarized under 5 headings [2]:

1. Case finding, which includes the promotion of reporting and assistance in getting medical attention for diagnosis and treatment
2. Giving or securing and supervising home nursing care for the carrying out of orders of private physicians and of health departments or other agencies
3. Instructions to individuals, families, and the community regarding quarantine, isolation, nursing care, preventive measures, use of community facilities, and the importance of the whole communicable disease problem
4. Promotion of immunization programs among infants, preschool children, and others in accordance with health department policies
5. Assistance in making studies of epidemiology, behavior of disease in a given community, and results of nursing service

In this discussion we are concerned with all of these phases of public health nursing service rather than with any one phase.

The experience of one nurse during a busy winter day illustrates very vividly how the public health nurse fulfils these functions.

I recall a nurse who started out in the morning making a kindergarten inspection. Little Johnny turned up with a running nose and sore throat. She sent him home immediately with a note to his mother to call a doctor. The doctor diagnosed the case as scarlet fever. Later on this same morning she went into a home where a youngster had been in bed for several days with scarlet fever. The mother, in a 4 room apartment, was carrying out perfect isolation technic. The nurse had traced the source of infection of this child and learning that other children had been playing with him at the time of exposure, had warned the other mothers to look for symptoms of a cold, to put the child to bed if such occurred, and to call a doctor.

As she was leaving this home the nurse met some relatives who were coming to call. She took the opportunity to explain to them what the placard meant; what she was doing for the child, and how the mother was carrying out isolation. She stressed the importance of keeping their children away from crowds during that season of the year. She explained that there were some diseases for which specific vaccines existed so that the diseases could probably be prevented. She referred specifically to smallpox and diphtheria. Incidentally, later on she discovered that these mothers, impressed with the illness of the child in the home they were about to visit, took their children to the physician for toxoid.

Finally that same day, the nurse was called from a window by a poverty stricken mother frantic because her Tony had a fever. The symptoms indicated a communicable disease; the family could not afford a private physician, so the nurse called the department of health, reporting the symptoms. The next morning Tony was taken to the isolation hospital—another case of scarlet fever under care.

After this busy day, the nurse returning to her office, made out a special report of the visits made to communicable diseases. This was her share in the statistical study being made by the health department on the nurse's part in communicable disease control.

Our position is this—Communicable diseases take a terrific toll in human lives, human comfort, and human safety. They can, in certain instances, be wiped out: in other instances, greatly reduced. The public health nurse is a tremendous force in accomplishing eradication and control. There are 20,000 public health nurses in the country. Why do we not use all of them, whether they be employed by health departments, schools, industries, or visiting nurse associations, to do this job more completely and more successfully?

The answer is that we are beset with obstacles which we have allowed to block our path. The first of these is poor reporting of cases—a constant problem for health departments, physicians, schools, industries, and nurses. Here is one of the nurse's first responsibilities—she should not and does not diagnose but she can suspect. While not a diagnostician, she can be a top-notch "suspectician." Immediately she has the opportunity to direct families to proper medical service. We should count more and more on the nurse, whether employed by health departments, schools, industries, or private agencies, to be more active in case finding and case reporting.

As soon as a case is found, diagnosed, and properly reported, the next problem for the nurse is to provide needed nursing service. We face immediately the question—are placarding and instruction enough? or does the mother need help in actual nursing and continuous advice? By and large, health department nurses and school nurses do not give bedside care. This means that where such care is needed, the patient must be transferred to an organization giving bedside care such as a visiting nurse association. Hence, we are dependent on a very fine appreciation on the part of official agency nurses as to the value of bedside care, and their active coöperation in turning cases over to the bedside nurse. Is there a well established plan of transferral in most communities? I fear not. Is the visiting nurse equipped not only to give bedside care but also to carry out the same instructions as given by the health department and then to transfer the case back to the health department for necessary termination? As any one who uses New York City subways knows, any process of shuttling is cumbersome and trying. One problem here is that some health departments, legally responsible for communicable disease cases, feel that their nurses must visit regardless of what other agencies are also sending in nurses. A solution might be that health departments legally deputize the local visiting nurse agencies to carry communicable disease cases during the period when bedside care is necessary.

All of this points to the fact so well brought out in the *Survey of Public Health Nursing*[3] made by the N.O.P.H.N., that we are confused by too many local agencies engaged in public health nursing service. Hence the recommendation of the Survey that we should try to condense our service locally into not more than two agencies, one the official for health supervision and communicable disease control, the other a private agency giving bedside care as part of a family health service. In small communities, all of these functions may well be carried by one agency.

Health department approval for the giving of communicable disease nursing on the part of visiting nurse associations and Metropolitan nurses is a necessary prerequisite to the service. In 335 Metropolitan Life Insurance Company services, we find that 82 per cent have such approval, 7 per cent have it for certain towns in the area but not for all, 11 per cent have no approval. This is a definite handicap to the service and one that indicates lack of understanding on the part of some health officers. In many instances, these are lay health officers in small communities—a problem in administrative practice as a whole.

Some of the blame for our errors in communicable disease nursing lies at the door of the very person we are talking about—the nurse herself. Two factors may lead to her own hesitancy to do communicable disease nursing: the limitation of her preparation in this field, and a sense of fear due to her own lack of immunization. In *Nursing Schools,*

Today and Tomorrow,[4] it is stated that of the students who were graduated in 1932, 9 of every 10 had less than 2 months' training in communicable disease nursing. In the handbook *Some Facts About Nursing*[5] we find that in January, 1935, in a study of 1,311 schools of nursing, less than three-fifths of the schools provided experience in communicable disease care. In a recent study of 177 Metropolitan salaried nurses, it was found that only 60 per cent had communicable disease nursing experience during their hospital training. To make up for this, 92 per cent of this group have been given practical demonstrations by Metropolitan supervisors, and all have received study programs and written instructions. Undoubtedly, one point of attack is the school of nursing, which should include both theory and practice in the basic curriculum. For the 20,000 nurses now employed in public health nursing, postgraduate work, institutes, and demonstrations are greatly needed. The excellent *Manual of Communicable Diseases for Public Health Nurses*[6] published by the New York State Department of Health might profitably be used by every public health nurse in the country.

The immunization of the nurse is also a factor. The National Organization for Public Health Nursing advises that nurses be immunized against smallpox, typhoid fever, and diphtheria before employment, and against scarlet fever if the local medical advisory committee approves. In a recent canvass of 150 Metropolitan salaried nurses, the percentages immunized were: smallpox 99, typhoid fever 80, diphtheria 53, and scarlet fever 22 per cent.

It would seem that greater attention to the immunization of nurses would encourage their more active participation in the program.

We have blamed organizations, including medical and nursing groups, for our limitations in communicable disease control, but the layman, too, is at fault. There are some boards of directors which still hold back permission for the staff to do communicable disease nursing. The responsibility comes back to the health officer, medical advisory committee and director of nurses to inform such boards of the importance and safety of such participation, under proper supervision, appropriate restriction, and administrative and educational control. We need to win favorable public opinion of board members, and of families, to the service. Let us explode the fear that the properly informed nurse may be a carrier of contagion. After all, how often does one hear of a cross-infection being carried by a public health nurse? Why does no one worry about the transmission of disease by a doctor who may touch the patient and fail to wash his hands? And yet the nurse who visits the home, washes her hands before and after her visit, wears a gown, and carries out a scrupulous technic, has been such a source of suspicion. If a nurse is unsafe to do communicable disease nursing, is she not equally unsafe for any other service? When we realize that nurses are dealing constantly with undiagnosed cases in their most infectious stages, it oftentimes seems ridiculous even to go through the precaution of visiting communicable disease cases the last part of the day.

In summarizing and concluding this discussion, I would say that many lives are being wasted because we are not making more effective use of all public health nurses. To correct this, 5 aids are suggested:

1. Better understanding of the whole service of public health nursing in this field on the part of physicians, health officers, school personnel, industries, and the lay public
2. Reduction of the number of public

health nursing agencies in over-organized communities and a joint plan of procedure and referral of cases between local agencies

3. Proper preparation of nurses in undergraduate schools, and postgraduate education through institutes, staff education programs, and special courses for all public health nurses

4. Approval by all health departments of the participation of bedside nursing agencies in the program, and the setting up of standing orders approved by both health departments and medical advisory committees for bedside care in this service

5. Investigative and promotive activities by all agencies, concerning the volume of service, results of service, the follow-up of cases hospitalized, the control of secondary cases, the immunization of all susceptible groups, etc.

What more challenging opportunity before public health nursing today, than to assist in the control and eradication of diseases that take a heavy toll especially among children yet are preventable, curable, and should be curtailed or wiped out!

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Freedom of Teaching

. . . We have not yet solved the problem of severance from our faculties of incompetent or lazy teachers and investigators. The presence of this incubus on the faculties of all our colleges and universities is a considerable hindrance to full freedom of teaching in all its implications because of the false issues in that regard sometimes raised by such teachers. . . .

. . . If a faculty could be found competent to administer a course in common sense for college professors, compulsory attendance, graduation, and periodic reëxamination might be made a condition both of appointment and tenure. Such a faculty may not be dominated by our present mine-run of college presidents and deans.—Extract from article, Educational Discussion. Freedom of Thought, Speech, and Teaching, by A. J. Carlson, *Bull. Am. Assoc. University Professors, Jan.,* 1937, p. 40.

Staphylococci in Relation to Food Poisoning*

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THE cause of outbreaks of acute gastrointestinal disturbance, which are common in the warm months of the year, usually has to be determined by the laboratory worker. Previous to 1930 the organisms most often thought to be responsible for such outbreaks were members of the paratyphoid or Salmonella group. Efforts to recover these organisms from the incriminated foods were usually not successful. Six years ago we [1] investigated an outbreak of food poisoning which resulted from eating a custard-filled sponge cake, and definitely demonstrated that a staphylococcus was the causative agent. Although Barber,[2] as early as 1914, had proved that milk in which a white staphylococcus had grown gave rise to acute gastrointestinal symptoms when swallowed by man, no outbreaks of food poisoning had been traced to staphylococci from that time until our report in 1930. In 1934 Jordan and Burrows [3] reported 9 outbreaks, and since many others have been reported in the literature.

The widespread occurrence of staphylococci in nature makes it impractical to attempt to keep foods in an environment free from these organisms. Some of the problems which arise are difficult to solve, since we have found no experimental animals which are as susceptible as man when fed the enterotoxic substance. Added to these difficulties is the fact that under laboratory conditions the strains do not always produce enterotoxic substance of equal potency. Further, there is a great variation in the susceptibility of various individuals to this substance when it is fed.

Whether or not all strains produce the enterotoxic substance is of great public health importance. Nearly all workers are agreed that strains vary greatly in this regard. Jordan [4] showed that strains of staphylococci of diverse origin and different cultural characters are capable of generating in broth a substance which, when taken by mouth, produces gastrointestinal disturbance. Stritar and Jordan [5] studied 94 strains from various sources and found that there are no good criteria for the differentiation of various types of staphylococci. The "food poisoning" strains agree with other members of the group in not constituting a clearly marked division. They stated that "the power to provoke food poisoning is not limited to any recognizable variety of staphylococcus." On the other hand Stone,[6]

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using a specially prepared gelatin medium, claimed that the food poisoning strains liquefy gelatin, whereas no liquefaction evidences a non-poisonous strain. More extensive work is necessary before this question can be definitely answered.

Apparently few of the many staphylococcus strains are capable of producing the enterotoxic substance under natural conditions. Dolman [7] said:

> My results indicate that the food poisoning substance is probably produced by only a few strains of staphylococci, and that it is a special metabolite whose formation and excretion are favored in the laboratory by such environmental conditions as a semi-fluid medium and an atmosphere containing a high percentage of carbon dioxide—conditions which promote, respectively, abundant growth and increased cellular permeability with partial buffering. It is difficult to imagine that circumstances approximating these can be attained in foodstuffs contaminated by staphylococci. The apparent rarity of staphylococcic food poisoning may hence be explicable.

It is difficult to know how many cases of food poisoning occur in a community. Where extensive outbreaks occur the health department is usually notified, but undoubtedly there are many cases in which physicians are not called and which are not reported.

The possible importance of starch in the production of the food poisoning substance was pointed out by Jordan and Burrows,[8] who found that bacteria of various kinds, *i.e.*, staphylococci, streptococci, Proteus, *Bact. coli*, *Bact. aerogenes* and *Salmonella aertrycke*, grown under suitable conditions, especially on starch media, were capable of producing a substance which caused gastrointestinal reactions in monkeys. By successive transfers on starch media, they succeeded in restoring the enterotoxic property to strains which originally had possessed it and had later failed to produce the toxic substance. Bacteria which had never possessed this characteristic could produce the toxic material when grown on starch media. In contrast to the view of Jordan and Burrows,[8] Stone,[6] in outbreaks occurring in California, observed that "protein was the only consistent major ingredient of the food involved in every outbreak."

In recent unpublished work [9] with meat sandwiches, a volunteer who ate ham contaminated with a "food poisoning" strain of staphylococcus became ill, with nausea, vomiting, diarrhea and prostration. Of two other volunteers who ate bread contaminated with the same organism, one developed typical severe symptoms of food poisoning and was ill for several days; the other was unaffected. The foods were incubated for several hours following inoculation with the "food poisoning" strain of staphylococcus.

In addition to these experiments, we [10] have shown that staphylococci inoculated into the prepared filler of a custard-filled cake invaded the cake substance. After a suitable incubation period enterotoxic substance was demonstrated by human feeding experiments in both the filler and the cake. The contaminated food was non-toxic before incubation.

Our experience would lead us to believe that apparently no special conditions, such as Dolman [7] suggested, have to be met for "food poisoning" staphylococci to produce enterotoxic substance in foodstuffs. Furthermore, the above experiments would indicate that enterotoxic substance may be produced under natural conditions in foods that are high in protein content, as well as in those that are rich in starch.

The nature of the substance causing staphylococcus food poisoning is still obscure. Jordan and Burrows [11] have found that the active principle will not distill off, is not readily dialyzable, is markedly unstable to N/100 NaOH and unstable to heat in N/100 HCl

solution. It was completely removed from acid aqueous solution with ethyl ether or chloroform. It is not completely destroyed by exposure for 30 minutes to the temperature of boiling water.[12] The toxic quality does not disappear after storage at a low temperature for as long as 67 days, although somewhat weakened.

This substance does not seem to be of the nature of a true exotoxin, since repeated feeding of filtrates to 4 volunteers [13] failed to immunize them. Serum from "immunized" men and rabbits did not protect monkeys or rabbits when it was mixed with potent filtrates and injected intravenously; nor did such serum protect a human volunteer who swallowed it mixed with a potent filtrate. The enterotoxic substance [14] was found to be distinct from hemolysin, dermotoxin and killing toxin (for rabbits). The gastrointestinal poison was more resistant to heating than the other toxins, and was not neutralized by antiserum which was effective against the others. Dolman [7] reported one individual who had received several subcutaneous injections of staphylococcus toxoid, as a consequence of which his serum showed a high neutralizing power against the hemolytic, dermonecrotic and lethal properties of the exotoxin. This individual subsequently developed a severe attack of food poisoning following the ingestion of a filtrate containing the enterotoxic property.

Outbreaks of food poisoning traced to stapylococci have, for the most part, incriminated cream-filled pastry or cakes, but a variety of other foods, such as cheese, gravy, doughnuts, milk, ice cream [15] and meat sandwiches,[16] have also served as vehicles. Since the list includes some of our important foods, efforts should be directed toward controlling this type of food poisoning. Although refrigeration is valuable, it is not a complete solution of the problem. Products may become contaminated during manufacture and the organisms lie dormant or multiply slowly during refrigeration. Unless refrigeration is continued after purchase, incubation for a few hours at room temperature may be sufficient for "food poisoning" staphylococci to multiply and elaborate their poison. The amount of contamination may have an important bearing on the subsequent growth of these organisms in food.

We [17] have found that reheating custard-filled puffs and éclairs for a time and at a temperature sufficient to kill staphylococci does not impair the flavor or appearance of the product. This method, if properly carried out, should afford an effective safeguard for these foods.

During the past 6 years much has been learned about the staphylococci which cause food poisoning. Much remains to be accomplished in this field.

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Tularemia in Czechoslovakia and Austria During 1936 and 1937

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DURING the hunting season, from November, 1936, to January, 1937, an outbreak of human tularemia was reported along the Austrian-Czechoslovakian frontier, in the provinces of Lower Austria, Austria; and the provinces of Moravia and Slovakia, Czechoslovakia. The epidemic was preceded by a rather extended and severe epizoötic among the hares. There are on record 103 cases in Lower Austria, 150 in Moravia, and 62 in Slovakia.

The territory affected is a plain around the estuary of the River Duja at Thayo, and along the Morava River at March, this giving reason to suppose that perhaps the muskrat and the water rat might have had some rôle in spreading the disease among the hares. The search for cadavers of hares was almost without success, as the rather numerous foxes in the region affected had disposed of sick animals.

No information could be obtained as to the insects feeding on rodents mentioned. Two hares were found with abscesses along the backbone, showing such location and configuration as might suggest an attack by some bird of prey (hawk).

All persons affected had been in contact with hares—touching, dressing, cooking, or eating—followed a few days later by fever, chills, headache, general pains in the body, and swelling of the glands. In some cases the primary effect was a distinct ulcer on the fingers, ulceroglandular form, with peritrochlear and axillary glands swollen. There were numerous cases with conjunctivitis, blepharitis, with swelling of periauricular .cervical glands. Glandular and typhoid cases were very few.

The specific agglutination test performed at the Bacteriological Institute in Bratislava revealed a rather high titer—from 640 to 5,080.

As there is a well founded belief that the disease must have existed in former years in Czechoslovakia, a special epidemiological commission is endeavoring to find by means of the agglutination test cases which might have occurred in previous years.

Institutional and Other Small Water Treatment Plants to Meet Unusual Conditions*

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THE design of small water treatment plants often presents problems more vexing than those of large municipal plants. In most cases it is not economically feasible to make an experimental study of the treatment of the particular water; it is necessary to be extremely economical, and in some cases one must design to meet the intelligence of the person who will have charge of the operation. In the work of rendering advisory assistance to governmental agencies, the Office of the District Engineer, Interstate Sanitary District No. 3, has had some experiences and worked out certain designs which may be of general interest.

The first survey by the incumbent District Engineer revealed that the water supply serving a certain group of about 400 persons consisted of water from a small impounded pool at the confluence of two overflow ditches from two lakes. This pool was near habitations and used, incidentally, for the disposal of some miscellaneous waste, for the watering of horses, and was even observed to be used for the washing of babies' undergarments. Is there little wonder that the life of many of these people was one spell of diarrhea after another?

In this case emergency chlorination was established and this was promptly followed by the installation of a commercial solution feed chlorinator. After the elapse of considerable time without the appropriation of the $15,000 fund recommended for a gravity type purification plant, plans were prepared for a 66" diameter pressure sand filter and pressure granular activated carbon dechlorinator with prechlorination and superchlorination. A pipe line was extended to one of the lakes.

After 5 years' experience with the above installation and 4 years' experience with a like and smaller installation, we are of the belief that pressure units are generally satisfactory where the raw water is not high in turbidity or bacterial content. The only unsatisfactory performance has been during 1 month of summer when plankton are on the rampage. A marked reduction in odor and taste trouble was overcome by applying a layer of powdered activated carbon to the surface of the sand filter after backwashing and bumping the filter to permit it to disperse in the sand bed. In both cases use has been made of two chemical pot feeders con-

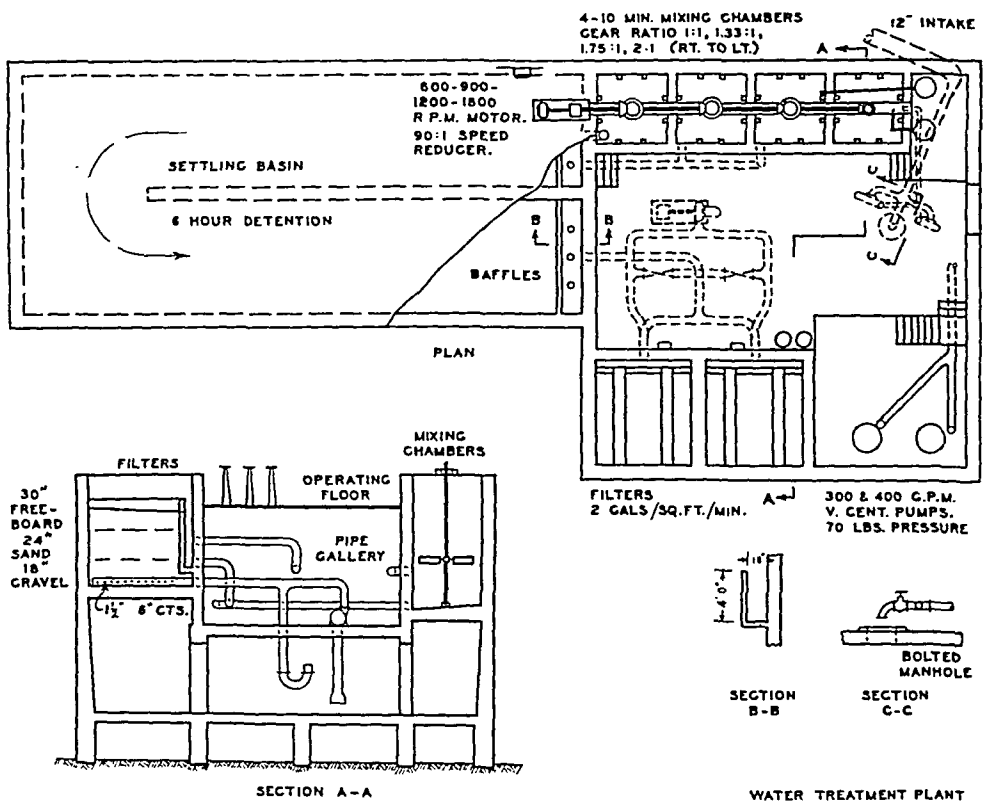
* Read before the Public Health Engineering Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936.

nected to orifice plates, one for feeding lump ammonium alum and one for a compound in the form of a ball consisting of soda ash and sodium aluminate to aid coagulation and adjust the pH. Both units were designed on the basis of 2 gal. per sq. ft. per min. and called for a blind flange in the sand filter valve nest to prevent accidental by-passing. Backwashing is effected with purified water at such a rate as to effect 40 to 50 per cent sand expansion. It is desirable that the large pressure units be equipped with loss of head and rate of flow indicators. The 66" diameter pressure filter plant with a 50 gal. per min. pump and chlorinator cost the government approximately $2,000 installed.

In one case with turbid and more highly contaminated river water, where economy and convenience so dictated, a pressure sand filter and a pressure carbon dechlorinator was installed following mechanical mixing and 6 hour coagulation and settling. The water is superchlorinated ahead of the filters. A special feature is provision to draw the settling basin down when completing a filter run so as to provide space to receive the backwash water which is introduced into the mixing basin where alum and lime are added as required.

The second problem was that of purifying river water to replace an existing shallow dug well supply which contained 11 p.p.m. of iron. Test wells revealed only iron containing water in the vicinity. This river is only slightly contaminated and seldom turbid, but it is high in color due to tannates, gallates, and organic acids from the swamps and

FIGURE I



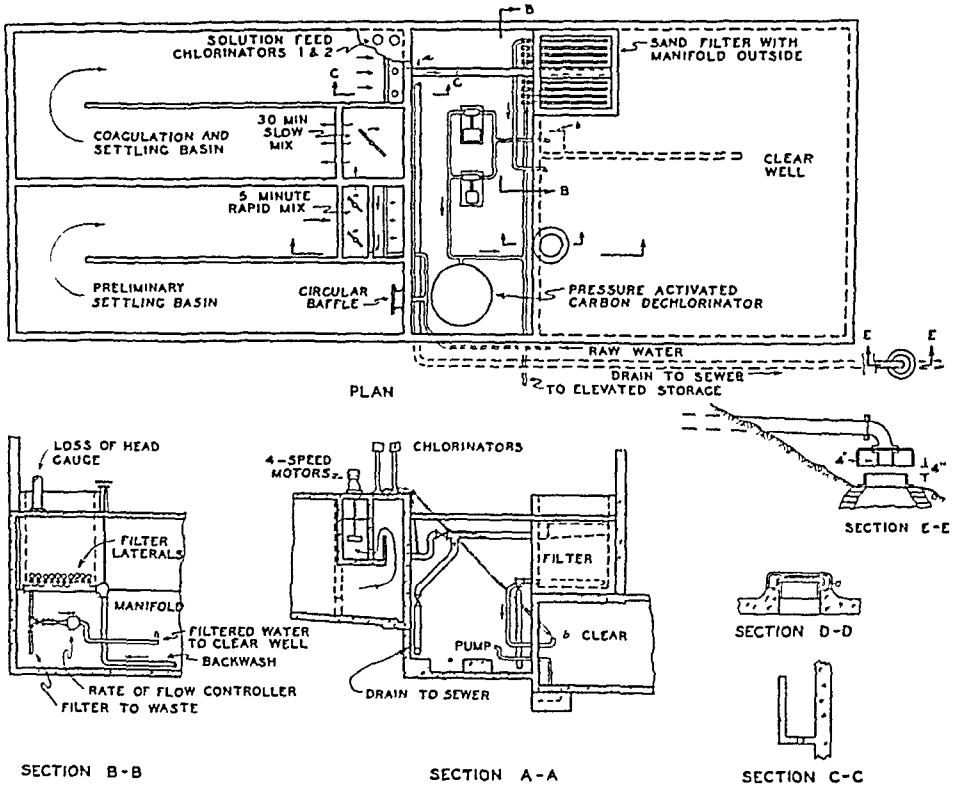
the logging operations conducted along the river. Being unable to install and operate an experimental plant, it was considered desirable to provide as much flexibility as possible in the treatment plant.

Figure I is a schematic drawing illustrating the main features of this, an early plant. The plant is built behind a power dam but the fall was not sufficient to avoid low lift. It has duplicate raw water and pure water pumps and duplicate chlorinators. For mixing of the chemicals there are provided 4, 10 min. mixing basins so arranged as to make it possible to effect 20, 30, or 40 min. mixing as desired. The stirring devices operate from one shaft connected to a speed reducer and a 4 speed motor (600, 900, 1,200 and 1,800 r.p.m.). The peripheral speed of the paddling is reduced from 3′ per min. to 1′ per min. by means of different ratio of gearing between the common shaft and the stem in each basin to which the paddle is attached. These gears can be replaced by gears of other ratios if desired. Each stirring device is provided with an independent clutch.

The coagulation and settling basin provides a 6 hr. displacement and the filters are designed on the basis of 2 gal. per sq. ft. per min.

Backwashing is done by means of a centrifugal pump drawing from the clear well. Chlorine can be introduced ahead of the mixing basins, ahead of the filter, as water flows to the clear well, or as it is pumped to the distribution system. The settling basins are covered by concrete slab and the entire structure is housed.

FIGURE II



The fire insurance people insisted, in the case of this lumber mill town, that means be provided for emergency use of river water for fire protection in view of the abandonment of the well which provided 400 gal. per min. This was done by providing a raw water outlet over a bolted manhole in the top of the clear well and the maintenance of one of the two chlorinators trained on this line at all times. This was considered passable in view of the fact that the contamination in the raw water never exceeded a *B. coli* index of 10 and the chlorine demand was low. This feature is illustrated in Figure I.

Chemicals are fed by oscillating tray type of dry feeders, alum being introduced into the first basin, lime in the second, and powdered activated carbon in the second or third basin when required during the summer. Complete color removal is effected with the proper dosage of alum.

This design for a plant of ¼ million gal. daily capacity cost the federal government $18,000. Credit for the detail of the design, based upon fundamental principles laid down by this office, is due Firman H. Brown, formerly in our employ.

Several plants to purify Missouri River water have been designed in this office, and constructed and operated under the general advisory supervision of this office. These are literally vest-pocket editions, and probably involve the best modern principles to a greater extent than any of their size. Their capacities range from 50 to 100 gal. per min.

Figure II illustrates the general lay-out and details of special purification and public health engineering features. With a water varying considerably in chemical constituents and from a very low to a 1,200 p.p.m. turbidity, it was desirable to provide preliminary settling as well as flexibility.

The water can be pumped to the preliminary settling basin or directly to the rapid mixing chamber, thus by-passing the preliminary settling basin. Other special features may be enumerated as follows:

1. A 5 min. rapid mix by means of two stirring devices. They are operated separately by 4 speed motors, 600, 900, 1,200 and 1,800 r.p.m. so reduced through gears as to provide a peripheral paddle speed of 3′ per min. at 900 r.p.m. This permits of 2 faster speeds and 1 slower speed than that usually prescribed.
2. A 30 min. slow mixing basin with 1 stirring device. This is operated by a 4 speed motor so reduced through gears as to effect a peripheral speed of 1′ per min. at a speed of 1,200 r.p.m. This permits of 2 slower speeds and 1 faster speed.
3. Six hr. detention period in both the preliminary and/or the coagulation-settling basin.
4. The use of a circular baffle at the inlet.
5. Duplicate chlorinators with one usually chlorinating ahead of the gravity sand filter and the other trained on the clear well influent. Chlorine can also be applied ahead or after mixing and to the suction of the pure water pumps.
6. The placing of the filter manifold (lateral header) outside the filter with provision for brushing or rodding the inside of each lateral. In this case this feature was necessary because the filter was too small for a header.
7. An activated carbon dechlorinator which not only insures a delectable drink of water, but also, and most important in the case where scientific operation is lacking, permits of superchlorination of the water. Superchlorination then takes care of variation in chlorine demand.
8. Duplicate raw and pure water pumps.

Other important public health engineering features are:

1. The separation of the settling basin and the clear well by the pipe gallery. Water plants should not have a common wall between these two features.
2. A concrete slab or roof over the coagulation and settling basin, as this is a stage in purification and should be protected against contamination. Where gratings are necessary, they may be permitted within that part covered by a building, provided the opening is curbed to prevent the introduction of floor washings.

3. The construction of the filter with independent walls and bottom so as to guard against leakage into the clear well. An air space should be provided between them.

4. The avoidance of a physical connection between the plant and a sanitary sewer or drain of any type. This is illustrated in Section EE on Figure II.

5. The provision of overlapping covers and monolithic concrete pedestal for all manholes as illustrated in Section DD.

The public health principles enumerated above are as applicable to large plants as to small plants.

Two such plants have been in operation about 1 year and have justified our fondest hopes that they could be operated effectively by the average stationary engineer.

One like plant of 120 gal. per min. capacity is now being built for use on creek water. The principle is the same but the preliminary settling basin is eliminated and both mixing basins are placed at the beginning of the coagulation-settling basin.

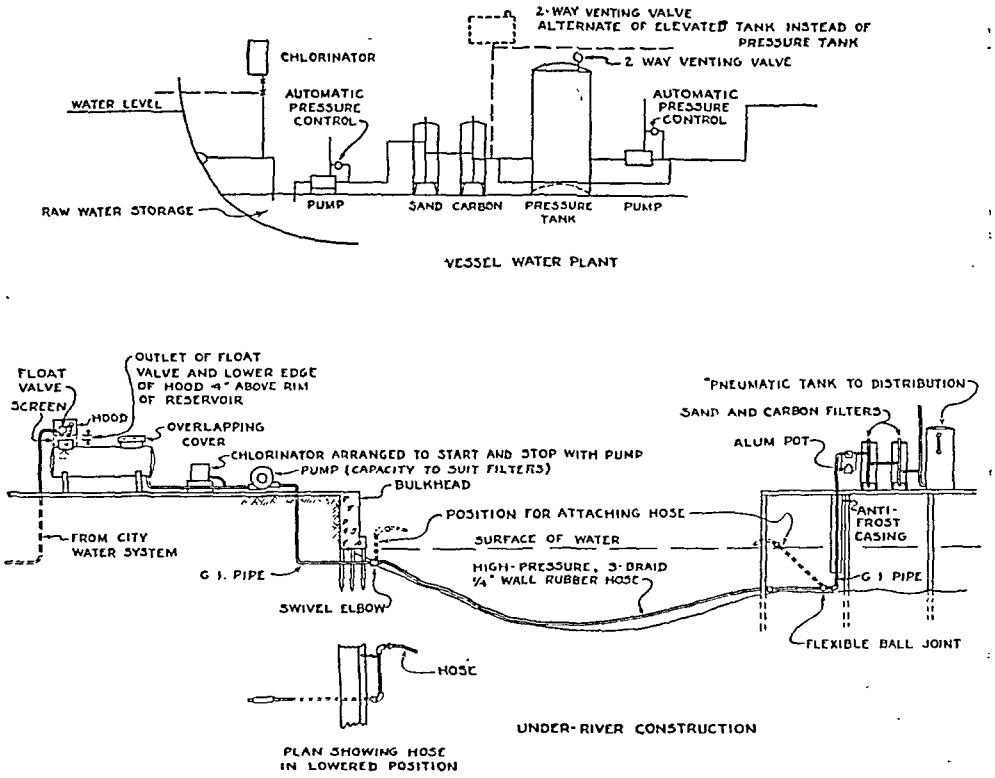
The 50 gal. per min. plant proper cost the government about $17,000, whereas the 100 gal. per min. plant cost approximately $25,000.

About 5 years ago the District Engineer was faced with the problem of designing water purification equipment for government vessels which regularly ply the Great Lakes. Since these vessels could load mid-lake or water of low bacterial content, tubidity and organic matter, chlorination was recommended. A decided advantage from chlorination is that all the domestic water can be treated, whereas with the other methods of treatment allowed on interstate vessels, distillation and sand filtration followed by ultra-violet ray or ozone sterilization, it is practical to treat only the drinking-culinary water. It was recognized immediately, however, that a seaman who was accustomed to dipping water from overboard and did not believe in our theory of disease transmission, would continue to do so unless the water was as palatable as the mid-lake water. This deduction led to the conclusion to provide dechlorination after superchlorination. The superchlorination gives added protection against variation in chlorine demand. Due to erroneous information, it appeared that the commercial chlorinators then on the market would not function efficiently on so low a flow as 4 gal. per min. The flow was thus limited because space available dictated the use of 20" pressure filters. This led to the development in this office of the SKM Hypochlorite Feeder which makes use of capillary tubing as the orifice of control of the flow of the solution. A description of this device was given before this Section and was published in the *Journal* of this Association October, 1933.

The first installation involved superchlorination followed by granular activated carbon dechlorination. The water was chlorinated as loaded and pumped through the carbon filter only about once a week to replenish the pure water supply. Under the condition on the vessel, the filter was subject to high temperatures. Although we always had residual chlorine in the water as it approached the carbon, the unit became a veritable incubator. This was first attributed to lack of filtration, but preceding new and bacterially free carbon by filtration failed to correct the condition. This trouble was completely corrected when means were provided to keep the carbon at a reasonable temperature through constant use. This experience has convinced us that activated carbon dechlorination should be preceded by filtration and maintained at a reasonable temperature.

To effect the proper temperature in a room of high temperature, a system was devised whereby the cool water from the ship's raw water storage tank

FIGURE III



is automatically passed through the treatment unit as water is drawn. An illustration of two types of installations appear at the top of Figure III.

After periods of operation from 2 to 5 years on 5 government vessels, the writer is convinced that the application of chlorine by the means devised is satisfactory and practical under these circumstances. The automatic plants have operated satisfactorily and the crews now report the absence of the former spells of diarrhea which periodically swept the entire crew, and the cooks mention the absence of "that tarry taste."

The Office of Interstate Sanitary District No. 3 is now faced with the problem of effecting purification of lake water for a government station located in the lake away from shore. The problem is that of purifying small quantities of contaminated surface water for populations of 5 to 15 persons. This problem has never been approached scientifically, but it becomes of greater and greater importance as the waters adjacent to certain resort hotels and residences become more highly contaminated.

Our office recently made recommendations regarding a government station built on piles 500' from shore. A new $3,000 well water plant was condemned because the water was highly contaminated. A satisfactory well at this station is not possible because the upper 15' of the casing would be surrounded by highly contaminated water (dilute sewage) and the casing terminates in limestone near a large city. The lake water was beyond treatment, so recommendations were made to pipe the city water across the river channel under

certain special conditions. The recommendations are illustrated in the lower part of Figure III.

Of special public health significance are the following factors:

1. The avoidance of piping city water directly across the channel thus protecting the city system against the entrance of contamination through leaky joints when negative heads occur in the city distribution system from heavy withdrawal during fires, the draining of mains, etc.
2. The physical separation between the delivery end of the city line and the receiving reservoir or surge tank.
3. The lack of under-water joints in the line of the station due to using high pressure rubber hose which can be secured in 500′ lengths
4. Superchlorination of the water before it is passed under the river with chlorine residual check, filtration and dechlorination on the station side.

No pump will be permitted on the station side and therefore it is not seen how a negative head could be created in this under-water line.

A serious study of the problem of purifying small quantities of water which is subject to varying degrees of contamination, has been begun by our office. In the development thus far, there has been borne in mind the desirability of being as practical as possible, to keep within the scope of the imagination of the average stationary engineer. In the case of the stations on the Great Lakes the cost of the plants will directly reflect the number installed during any given time. Therefore, extreme economy is being practised.

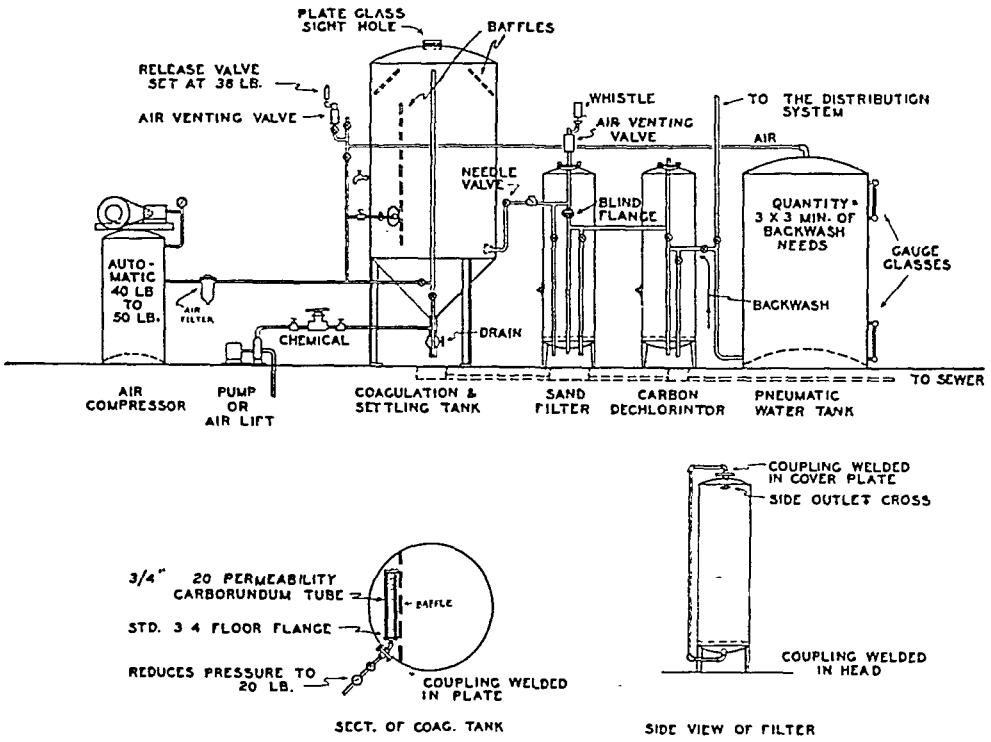
Figure IV illustrates an experimental plant as it has been built at a breakwater station opposite Chicago. It is a 300 gal. batch treatment plant. This plant is for those cases where the water requires coagulation and settling.

In the interest of economy it became apparent that money could be saved on pumps and a stirring device, by the use of compressed air. As illustrated, compressed air is used to mix the chemical and the water, to force the settled water through the filters, to maintain pressure in the distribution system and to force purified water upward through the filters for backwashing purposes. Air might also be used to lift the water from the lake.

With the coagulation-settling tank under no pressure, water is pumped into it until it overflows. The proper quantity of high test hypochlorite in powdered form, alum, and lime are introduced into the large tee near the pump which is provided with a screw cap. The pump is then operated long enough to convey the chemicals to the coagulating tank. Air is then introduced into the carborundum tube at a sufficient rate to effect rapid mixing, and after 5 min. the air is valved down to a predetermined rate to effect 30 min. of slow mixing. The air is then turned off and the floc allowed to settle for 6 to 24 hr. Air is then applied to the top of the coagulating tank through the overflow pipe and the settled water is forced through the sand filter and carbon dechlorinator to the pressure tank as required. When the coagulating tank empties to the point of the outlet, air passes to the whistle on top of the sand filter and gives the alarm, indicating that the air should be shut off. To backwash the units, air is applied to the top of the pneumatic tank. While each daily batch is settling, service is rendered from the pneumatic tank by the maintenance of air pressure on top of this tank. The release valve set at 38 lb serves to maintain house pressure and gradually to release the excess air in the pneumatic tank.

It is thought that the advantages of aeration, superchlorination, and long time settling may make it possible to purify water which is beyond the safe limits established by Streeter of the Public Health Service for constant flow municipal plants on the Ohio river.

FIGURE IV



BATCH WATER TREATMENT PLANT

The 300 gal. plant with all tanks galvanized, cost the government approximately $600. It has been operated thus far only sufficiently to report that it is satisfactory mechanically and the air mix appears, from visual observation, to produce a satisfactory floc.

Several batch treatment plants using two 8′ by 8′ redwood tanks as coagulation-settling tanks are now being built at government agencies. Settled water will be drawn from one tank while the other tank is in process of being filled, coagulated, and settled. Units of this kind might be practically applicable and desirable as to cost, for small villages, resort hotels, and groups of summer residences. With the open tank unit it will be necessary to pump the settled water to the pressure filters. Stirring for mixing and coagulation may be accomplished by standard stirring mechanisms or by air. The limit of capacity of this type of unit seems to be only the size of tank or the frequency with which batches might be prepared. Where it is desirable to make but one batch a day, possibly 20,000 to 30,000 gal. would be the limit, but where batches might be made at will, it is reasonable to expect that, due to the quiescent condition of settling, a batch could be made every 2 to 3 hr. At 3 hour intervals and a 20,000 gal. unit, the capacity would be 160,000 gal. per 24 hr.

It is planned to study the application of stone filters, especially the type that can be scraped mechanically. It is generally recognized that the material that collects on stone filters forms a growing media for bacteria and after that the

effluent is worse than the influent. However, no study has been made to determine their serviceability with prechlorination and superchlorination. Stone filters have the advantage of avoiding the burdens of backwashing and would be applicable to small lake stations where the water is relatively pure and where only the drinking-culinary water needs to be filtered and dechlorinated.

A study will also be made of filtering through disc of composition wall board. The discs would be replaced instead of attempting to clean them. This method could be used in conjunction with coagulation and settling, whereas the floc would clog a stone filter.

In conclusion, it is desired to give credit for the detail of design, based upon fundamental principles laid down by the District Engineer, of the 50. 100 and 120 gal. per min. gravity plants, to Arnold Nesheim, a designing sanitary engineer, now associated with the U. S. Indian Service.

Indians Donate to Red Cross

THERE is one community in America which has not asked or received any relief during the depression years. It is not a large community, but its coöperative organization has made possible the meeting of all human want without doles or relief grants.

This Indian community of Metlakahtla in the Annette Islands in southeastern Alaska has wired the Commissioner of Indian Affairs, John Collier, its desire to donate a thousand dollars to the Red Cross for flood relief. No government official solicited or suggested this action. It came unasked for a free will offering. . . .

Taking advantage of their location, lying within the boundaries of the salmon fishing industry, the Tsimpshean Indians have built up a profitable fishing business and erected their own cannery. The community profit from the cannery is $70,000 a year, which is used to support the public utilities of the village. In addition, the natives employed in the cannery receive about $75,000 a year in wages. The cannery is operated under the general supervision of the Office of Indian Affairs of the Department of the Interior.—Dept. of the Interior, Release Mar. 6, 1937.

The Identification of Streptococcus of Mastitis in Routine Milk Samples*

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BOVINE mastitis is recognized not only as an economic but also as a public health problem. It may be caused by a variety of microörganisms and may present clinical conditions of the udder and chemical changes in the milk that are not necessarily dependent on the type of bacterium involved. A variety of laboratory tests on the milk have been suggested as diagnostic procedures in addition to physical examination of the udder. Bacteriological methods are preferred because they appear to give the best results in early cases. These methods should include not only the demonstration of streptococci but also identification of the types involved.

About 90 per cent of streptococcus strains causing bovine mastitis can be classed as *Streptococcus agalactiae*. The cultural characteristics are: (1) hemolysis on blood agar plates varies from gamma to alpha prime or alpha type; (2) usually long chains in preparations from broth or uncurdled milk cultures; (3) in litmus milk, acid with curdling and reduction of color starting from the bottom of the tube; (4) hydrolysis of sodium hippurate; (5) esculin not split; (6) rough growth in broth. The method of isolation of the organisms consisted of some form of preliminary incubation of the samples showing streptococci in chains, followed by plating on blood agar.

Four hundred and forty-one strains from 630 routine milk samples were isolated and classified. Of these, 52 per cent were *Strep. agalactiae* and 34 per cent were *Strep. lactis* or *Strep. fecalis*. *Strep. hemolyticus* was found only once. "One hundred and forty of the 228 strains of *Strep. agalactiae* were obtained from samples giving high cell counts (over 500,000 per c.c.) and showing streptococci in the direct microscopic smear of the unincubated samples; 60 were from samples showing streptococci and low cell counts (under 500,000 per c.c.) and 28 were from samples with high cell counts only." The finding of long or short chains of streptococci did not correlate with ability to isolate this organism.

It is believed that routine bacteriologic examination of composite milk samples, followed, when indicated, by examination of milk from individual animals, will often reveal mastitis infection in the absence of physical symptoms and will result in early segregation of affected cows.

* Abstract of a paper read before the Laboratory Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 22, 1936.

Recent Progress in Health Education*

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HEALTH education has always been inseparable from medicine and public health. Pasteur probably spent as much energy explaining his discoveries as in making them. Jenner, Lister, Chadwick, Simon, and Biggs were health educators perforce. Many successful physicians and public health men have spent much time in health education. Nevertheless, health education is among the more recently enucleated subdivisions of public health. It has only emerged in recent years as a specialized group of knowledges, skills, and technics.

Our knowledges, skills, and technics in health education are still incomplete and defective. This is due to: the youth of the work; changes in educational methods; lack of integration with related fields, such as education and psychology; preoccupation on the part of school and health administrators with other matters; dispersion of interest among many groups—teachers, physicians, nurses, health officers, and others. Nevertheless, encouraging advances are beginning to appear in this field. If properly nurtured, this infant may grow to become a leading scion of public health.

Health education is defined as "the sum of all experiences which favorably influence habits, attitudes, and knowledge relating to individual, community, and racial health."[1] Its importance can no longer be overlooked. Smillie[2] emphasizes its special significance in the United States:

> The average American will not coöperate with, nor support a public measure he does not thoroughly understand and approve in its principle and its detail. Thus, the health officer is compelled to inform the public fully concerning his plans and policies in order to secure the community's support for his program.

Wilbur[3] says:

> We are grasping the fact that education is not a mere transfer of information from one mind to another, but that it is a manifold process by which a growing person learns how to operate under his own power and will. Particularly in the sphere of health we must learn by doing, and what we do must be done with understanding.

Health education is divided into 3 major fields, distinct to an unfortunate degree at this time:

1. Public Health Education, or Health Education of the Public, is that part of health education that takes place in home and community. This is the field that concerns health officers and executives of voluntary health agencies most directly.

2. School Health Education is that part of health education that takes place in the school or through efforts organized and conducted by school personnel.

3. Health Education of Professional

* Read at a Special Session of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 20, 1936.

Groups has to do with efforts conducted either by the professional school or the public health agency to increase the public health knowledge of public officials, physicians, medical students, nurses, teachers, sanitary officers, statisticians, bacteriologists, and other professional people.

ADVANCES IN HEALTH EDUCATION OF THE PUBLIC

In this field, we have usually failed to distinguished between health education and health information. It is one thing to inform people of health facts; another to have them modify their conduct on the basis of this information. The frequency with which they do so depends upon their education. Permanent improvement of health conduct is probably rare with present methods.

We have tended to confuse health publicity, propaganda, and service with health education. Overemphasis on them may actually impede true education. Too much or poorly directed propaganda often repels the intended convert. Providing health service such as school health examinations and diphtheria immunizations does not of itself lead people thenceforth to seek these same services on their own initiative.

Despite these faults, there have been several recent occurrences which indicate advancement.

1. *"We can Stamp out Syphilis"*—Probably the most outstanding recent event in this field is the admission of the word syphilis to the American drawing-room. For years, we have known more than enough to control syphilis. Methods used in the U. S. Army, in Japan, and in Sweden have proved effective. The traditional "hush attitude" of the public regarding venereal diseases has thwarted most efforts, and year after year syphilis has taken its unnecessary toll. It has included the so-called "innocent victims" whose ignorance was far more significant than their innocence. Health departments and the American Social Hygiene Association have hammered for decades at this closed door. Their efforts were finally rewarded when a wise public health official made an issue of his exclusion from a broadcasting studio because his address mentioned syphilis. This precipitated a nation-wide discussion leading to an opening of that door.

The press in many cities has now lifted its ban on this word. *The Readers Digest* abstracted an illuminating article on syphilis and offered reprints at cost. Since July, nearly 300,000 have been ordered.[4] A new talking picture on syphilis is meeting unprecedented success. Health departments are obtaining financial support for promising plans to control this scourge, the success of which will depend largely upon education.

2. *Reënlistment of the Medical Profession in Health Education*—The past few years have seen a renewed interest in health education by the medical profession. There never was a better time or place for health education than when the individual sought aid from his physician.

The American Medical Association through its Bureau of Health and Public Instruction conducted 31 dramatized broadcasts in 1935.[5] They have been arranged with unusual skill, and are to be repeated this year. Accepting commercial advertisers' estimates that only 1 per cent of the radio audience responds to offers of printed or other materials, these programs reached a maximum of over half a million persons. Several state and more county medical societies have arranged or coöperated with others in radio broadcasts.

The medical and health exhibits at

the larger expositions arranged by medical societies reflect this increased interest in health education by physicians. The Century of Progress and the Texas Centennial are examples. State and county medical societies and their auxiliaries in many places are conducting traveling exhibits.

Medical societies are organizing speakers' bureaus, offering assistance to voluntary public health agencies. There is more active participation by practising physicians in local health department activities than formerly. The Detroit Plan is well known and is being emulated elsewhere. The Health Officer of Baltimore reports that in 1934 one-fourth of all diphtheria immunizations were done by private physicians.[6]

Several localities are following the plan established by the New Jersey Medical Society wherein each physician agrees to set aside 1 office hour, known as the public health hour, for immunizations, periodic health examinations, and the like.

Leaders in school health education were evidently impressed by the number and good counsel of physicians attending the 1935 Iowa City conference on school health education. One committee of this conference, composed largely of teachers, reported, "When county medical societies and other such organizations share the responsibility for a coöperative arrangement, more effective work is done than when the school takes the sole leadership."[7] This conference heard from Cabell County, W. Va., that the County Medical and County Dental Societies take the lead in a dual program of medical participation in the community health program.[8]

Encouraging and necessary as this advance is, it presents one danger—physicians may fall into the same errors committed by health officers and nurses, confusing information with education, overemphasizing propaganda and service, and overlooking education. This is especially serious in the schools. The physician has an important responsibility in advising the teacher regarding *what* to teach. Without special training in educational methods, he has no place in the classroom trying to show the teacher *how* to teach.

3. *The Motion Picture in Health Education*—The motion picture is becoming a valuable aid in teaching. Films especially prepared for this purpose are increasing in number and improving in quality. Newly constructed city schools and auditoriums are usually equipped with projection facilities. Portable projectors for use in smaller schools are selling rapidly.

Nearly 10 years ago, Lee K. Frankel and I pleaded with one of the major film executives in Hollywood to produce a play dramatizing some of the outstanding events in preventive medicine. We left him unmoved. The past year has seen produced "Life of Louis Pasteur" and "The White Angel." These were not only box office successes, but have proved to be "experiences which favorably influence habits, attitudes, and knowledge relating to health." This was possible only because some degree of education had prepared the public to enjoy the drama and utilize the information presented. These plays have lifted horizons in health education. It never occurred to us that people would pay generously for being educated in health.

4. *Radio*—The radio is undoubtedly a potent force in education, since it is now found in three-fourths of all homes in the United States,[9] but its appropriate use in health education is still obscure. Turner[10] found only 1 person per 1,000 who heard 4 State Health Department broadcasts in a given week. Kirkpatrick[11] shows the radio to be a double-edged sword, since 25 per cent of his listeners reported resolving not

to buy the goods advertised because of disgust with the radio program.

Some progress has been made recently in solving these problems for health education. The American Medical Association broadcasts have been mentioned.[5] In Rochester, N. Y., a broadcast sponsored by the County Medical, Dental, and Tuberculosis and Health Societies resulted in the mailing of 45,820 copies of the talks in response to requests.[12] The success of the Chicago Health Department broadcasts seems generally accepted. For several years, the Los Angeles County Health Department has produced weekly radio dramas based on actual occurrences. Several commercially sponsored broadcasts have met with success and scientific approval.

It is not generally known that broadcasting stations and the Federal Communications Commission are sensitive to protests concerning false health advertising and quacks.[13]

Conclusions reached thus far seem to be that dramatization is important; that skilled speakers or actors are required; that the radio serves somewhat the same function as the billboard, making a temporary impression and perhaps opening the way for more detailed presentation through other means. It would seem wise for health agencies not to attempt broadcasting in the absence of expert assistance. Such attempts are often attended by the danger of ineffectiveness, and may actually exert a negative influence.

5. *Museums and Exhibits* — State health departments, medical societies, and voluntary health organizations are using exhibits more extensively. The Dresden Museum of Hygiene has made a lasting impression. Plans are already under way for health museums at the 1939 fairs in New York and San Francisco. This Association's Committee on a Museum of Hygiene is making steady progress. It already distinguishes between a popular museum designed to draw crowds and a teaching museum which must aim at completeness. It points out that any museum must have a continuous and competent publicity and promotion program; it must be combined with a proper community program. The technic of presentation is more important to popularity than the selection of subject matter. Performance by the visitor of some act in connection with an exhibit aids in fixing it in his mind. Museum fatigue must be studied and avoided.[14]

Hygiene museums should be an attractive field for philanthropists who may be interested in public health. They have the advantages of uniqueness, usefulness in perpetuation, a tangible monument to the donor's memory.

6. *Publications* — Although medical men are little given to journalism, books, magazine and newspaper articles devoted to health subjects are increasing and improving. Medical men have been more attracted to authorship in recent years, and have in general acquitted themselves well. The American Medical Association is sponsoring a series of popular health books, the first of which, *Healthful Living*, by Diehl, has already appeared. The National Health Council has revised its series of health booklets.

7. *U. S. Public Health Service Office of Health Education*—Early this year, the Surgeon General announced the establishment in the U. S. Public Health Service of the Office of Health Education. Its purpose is to carry out experimental studies and assist those interested in health education. This is the first time the Service has dignified this sub-division of public health by the establishment of a separate office.

8. *Precision in the Choice of Methods* —There has long been a tendency to

judge our work on the basis of effort expended rather than results accomplished.[15] There is evidence from many sides that health educators are attempting to analyze, evaluate, and select their methods. Self-appraisal is becoming a watchword in health education. We are beginning to realize that a problem in health education requires technical skill.

The aim is: (1) to arouse curiosity, (2) to enlist sympathy, (3) to impart information, (4) to lead to action. This sequence can develop only when we have full command of appropriate methods and a thorough understanding of the audience. Audiences differ enormously. Individual and collective prejudices, superstitions, susceptibilities must be recognized by the health educator and dealt with much like the current of a river which can be gently diverted but not suddenly reversed. Galdston says:

> Bread is the staff of life, and yet how different the breadstick of the Italian from the pancake loaf of the Armenian; though each is bread, still will the one be eschewed in preferment to the other—one's own bread. It is for us to be mindful of man's preferments in instruction as in bread.[16]

When we come to precise selection of methods, it is the ambition of those specializing in health education of the public to be able to answer promptly and specifically such questions as: Given adequate facilities, what is the best way:

> To bring about an effective tuberculosis control program in a negro community?
>
> To obtain a high proportion of smallpox vaccinations in a Polish community?
>
> To obtain a high percentage of tuberculin tests and X-rays in a city school having a large proportion of "conscientious objectors"?
>
> To persuade expectant mothers in a rural New England community to seek early medical care?

The answers to these questions may not include fundamental educational processes, although they could be made to do so. They will, however, lead to clarification of our procedure, and will increase the value of health education as the term is now generally conceived.

Such questions present many facets, and each must be studied if we are to find an answer which will avoid the debacle of "talking health in Polish to Greek immigrants."[17] It is not enough to decide what to do in health education of the public. We must carefully study the complexities of the group in which it is to be done, select the tools with which to do it, and use these tools with skill based upon experience.

A method of identifying and measuring health attitudes in different groups has been suggested[18] and is being tried. In Detroit, "health guilds" are organized by the Health Department, each recruited from an existing community interest.[19] Letters and post-cards are being tried to reduce the number of unproductive nurse visits. One letter is written in several ways, and a close score kept on the effectiveness of each. It was found that an unstamped return envelope addressed to the health officer and marked "personal" elicited more replies than a business reply card on which the postage was prepaid.

There is much better discrimination as to what to teach than formerly. We are learning to distinguish between the "Grade A" and "Grade B" facts referred to by Armstrong[20] and to disseminate them accordingly. Health education is emerging from the "whoopla era" to one of sustained serious effort. The spectacular pageants and parades of a few years ago are being abandoned in favor of steady, continuous pressure by sounder methods.[21]

ADVANCES IN SCHOOL HEALTH EDUCATION

School health education advances may be less familiar to this group.

They are profound, and significant to other forms of health education. Methods pursued by teachers will prove helpful in health education of the public. As our methods for health education of the public become more refined, they will follow more closely the fundamental educational principles developed in the schools.

These advances forecast the dawn of a new day for the health officer. He will have a future generation to deal with which is already familiar with the health problems of the individual and the community.

For years we have bombarded our allies, the school teachers, with criticism, much of it destructive. We have carried the unquestioned authority accorded us in the hospital into the school. We have complained of content of health courses without offering a better substitute. We have scoffed at the teacher's lack of health knowledge without serious effort to inform her. We have complained of lack of results. At last, teachers have taken up a careful analysis of their own situation. And, this is probably less in self-defense than in enthusiasm for a great cause which we have poorly espoused.

1. *Fundamentals Generally Accepted* —It is pretty well agreed that

> . . . the problem in education today is no longer merely that of learning a few specific skills, habits, and attitudes which are for a specific task; it is, in addition, the problem of securing the ability and the desire to change continually and adapt oneself to new discoveries. Adaptability is most essential if one is to meet happily and successfully the world's changing complexity.[22]

Health authorities should meet their responsibility of advising what to teach. The teacher, on the other hand, should decide when and how to teach.[23]

2. *Integration of School Health and of School and Community Health*— Health is not an object which can be permanently possessed or not possessed, which can be measured accurately, which can be invariably changed at will. It is a way of life. It is influenced by many factors, not all of them controllable, few of them static.

The present school health education program has developed from the gradual converging of three separate streams of thought: the old hygiene instruction largely instigated by the W.C.T.U.; the school health service program introducing the physician and nurse into the school system; and the physical education program. A fourth stream, mental hygiene, is now making itself felt. Influencing the school from another direction has been the development of the community public health program. The time has come to integrate these and all other forces which influence the health of the school child.

Not for much longer will school health be a distinct activity separated from all other public health work. Progress has been made in correlating school health work with that of the community, and in correlating it within the school.

Community health service is inseparably linked with health education. The school has the responsibility of being the connecting link between the various agencies contributing to health and protection of the school child. Teachers, nurses, parents, representatives of the health department, personal physicians, and the children themselves must work together in enriching and planning the curricula.[24]

Kalamazoo has made progress in this direction after many months were spent on integration. So many agencies of the community and departments within the school system were found to be involved in health matters that a "chairman of health-contributing agencies" was appointed. This chairman arranged series of meetings and con-

sultations, and a program of procedure was unanimously agreed upon and published.[25]

Shaw has said:

> Health lends itself well to integration with other subjects because of its close relation to the whole of life. There is scarcely any subject which children might select for study or investigation which has not some relation to health.[26]

3. *Curriculum Building*—Since health is so vital a factor permeating the daily life of the school child, teachers are concluding that health teaching need not necessarily be confined to formal class periods devoted to hygiene, physiology, or similar subjects. The modern curriculum is built around units of work. These units in turn are based upon a careful analysis of the demands placed upon the good citizen by his present environment. Such demands invariably include health problems.

Virginia has recently revised its whole public school curriculum on this basis

Another example is in Cattaraugus County.[27] Here, committees of teachers were organized who met regularly and established desirable objectives. These were established only after repeated consultations with school nurses, health officers, private physicians, and others who could bring in authoritative advice on local health problems. Local morbidity and mortality rates were studied and explained by health officers and nurses. Local customs, prejudices, and habits were given careful consideration. The remedy for each of these problems was sought from the health experts. Then the committee started to devise ways of teaching the habits, attitudes, and conduct which would, in the opinion of the experts, provide the needed remedy. Programs were constructed and experimented with. Those successful were disseminated to other teachers.

A good example of this method is a project based on growth and nutrition in a country school. Several young chickens were donated. Pens were constructed, and feeding and weighing were done by the children. The chickens were divided into two groups, and the controls were given milk and cod liver oil as a part of their ration. At the end of a few weeks, one youngster, a confirmed coffee drinker, remarked that the milk-fed chickens were larger than the others. The milk-fed chickens weighed 13 per cent more than their brothers. The teacher believed the experiment was proving its worth.[28] The project included elements of biology, physiology, dietetics, arithmetic, craftsmanship, and others.

Turner has developed an excellent teaching unit of this kind on elementary bacteriology.[29] It requires no extensive laboratory apparatus. It introduces the child to the microscopic world in general, taking up pathogenic bacteria only after a proper background has been established. He says:

> If a child had never been outside a city, his first introduction to the plants of the open country should be to the flowers, trees, and grasses—not to poison ivy![30]

History can be taught as a record of man's striving for and achieving a better life. The study of civics is filled with health opportunities. Reading and art study offer a rich health field. The physician's examination, contact with the nurse, ventilation, lighting, handwashing facilities, and many commonplaces in the child's natural surroundings furnish excellent material for health teaching. Often, defects of the school plant are remedied when children call them to parents' attention.

4. *School Nurse Relationships* — Never before has the nurse been so important a factor in school health education. Heretofore, there was no clear understanding among all concerned as to what the nurse was to do.

Today, the well qualified school nurse makes herself more valuable by developing a closer relationship with the teacher, sharing information about the child, aiding a better understanding of the child through her contribution of professional knowledge and by a careful study of her well kept records. She is especially important in the health education of the parents, interpreting the teacher and the school physician to them.

No longer is the qualified school nurse remaining aloof from the educational program. She is becoming an actively functioning member of the faculty, developing the case study method of analyzing behavior, making intelligent use of community health resources by acting as a liaison between them and the school, contributing to curriculum construction and to methods and materials of instruction.[31] Without special training, she is more inclined to leave the actual teaching to teachers. Much of the modern program of integration and curriculum building in health depends upon the nurse.

5. *Attempts at Evaluation*—As in the general public health field, more scrutiny is being given to values and results. Publication of the *Pathway to Correction* by the American Child Health Association served to call attention to the fact that school health service had not accomplished its function by the mere detection of physical defects. Further studies are now under way to analyze and apply the results of this inquiry.

Better measures of health attitudes and health behavior are being sought.[32] One school health director believes that many physical defects, at least in the higher economic groups, would be found and corrected without the school examination and follow-up.[33] Wood cautions that these attempts at evaluation should not result in abandonment of old methods until we have a better substitute.[34]

6. *Improved School Environment*—When children are required by law to go to school, a serious responsibility falls upon the board of education for their health protection. Considerable advance has been made in proper seating, lighting, and ventilation. The roller towel and common drinking cup are rare sights today, even in 1 room rural schools. Handwashing facilities, however, are still inadequate in many places.

Distinct advances have been made in providing safe drinking water, rest periods, and a well conducted school lunch period.

> Attention is now being given to overstimulation, both in the school and in the home; school report cards are being scrutinized as possible factors contributing to emotional strain; the 100 per cent attendance pressure is being viewed from the health standpoint.[35]

7. *Teacher Health*—This is gradually receiving the attention it deserves. Increased recognition of the effect of poor health upon the teacher's emotional state, and renewed attention to the communicability of tuberculosis have tended to make superintendents and school boards insist upon periodic physical examinations for teachers. Training schools are selecting future teachers with more regard to their mental and physical health.

8. *Consultation Services*—There has long been an urgent need for accessible consultation facilities where teachers could obtain sound advice and prompt assistance with their health problems. This need is reflected in the active correspondence of such agencies as the former American Child Health Association, the National Tuberculosis Association, the School Health Bureau of the Metropolitan Life Insurance Company. The latter receives nearly 50,000 letters a year from school administra-

tors and teachers. In the first 6 months of its existence, the School Health Education Service of the Joint Committee of the American Medical Association and the National Education Association received nearly 5,000 letters from school administrators and teachers.[36] The Federal Office of Education and various state departments of education, notably New York, are beginning to respond to this demand with encouraging results. They should eventually care for most, if not all, of the consultation services now provided by voluntary agencies.

9. *Tuberculosis Case Finding in Schools*—The campaign of the National Tuberculosis Association for tuberculin testing, follow-up, and X-ray of positives in schools has done much to stimulate the entire school health movement. Some schools and teachers have recently encountered modern school health for the first time through the activity of the local tuberculosis association. It should be remembered that a high percentage of tuberculin testing is not our ultimate goal. The real goal is to educate concerning health so that tuberculosis will be reduced. Tuberculin testing is an aid to achieving this real goal.

HEALTH EDUCATION OF PROFESSIONAL GROUPS

Progress in this third branch of the field of health education is better known to this group, and will not be detailed. Availability of federal funds for the training of public health personnel has brought about a new era so suddenly that we hardly appreciate its significance. Training of personnel is the best remedy to cure the old vicious circle. This circle comprises inadequate public health funds, incompetent public health personnel, lack of results, and lack of appreciation leading to still less adequate funds, and, perforce, less competent personnel. There are other points to attack this vicious circle, such as political reform and improved legislation. But none will be more likely to reverse the vicious into the benign circle than well trained, carefully selected, skillful, competent public health personnel.

In-service training of teachers, physicians, and nurses has developed rapidly in recent years. One of the most extensive programs of in-service training is the work of the Kellogg Foundation.[37]

CONCLUSIONS

It is evident that health education of the public, in the schools, and in professional groups, is receiving increased emphasis. This is shown by recent advances in this field along many fronts. The U. S. Public Health Service, American Medical Association, National Education Association, National Tuberculosis Association, motion picture industry, various foundations, and many schools and health agencies have made recent substantial progress. The American Public Health Association is contributing to this progress in practically all sections and in several committees. If we are to continue leadership in this field, we must give it even more attention, losing no opportunities to encourage research, assist members to avoid past mistakes, and facilitate interchange of experience in related fields. Especially unfortunate in the past has been the seclusion from each other of physicians and school administrators, teachers and nurses, public health officers and educators, and even school physicians and health officers. All have much in common in the field of health education, a field which promises to become at once the best defender and best champion of public health.

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A Critical Study of Various Types of Detergents and Disinfectants for Use in Dishwashing*

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IN 1919, Cumming and associates [1] showed that not only do dishes improperly washed and sterilized carry many bacteria, but may act as conveyors of disease. In 1934, Mallmann and Devereux [2] showed that glasses in beer establishments and soda fountains when improperly sterilized carry large numbers of bacteria. Lyon [3] in coöperation with the writer showed that approximately 20 per cent of the unwashed glasses in one beer saloon carried spirochetes on the rims. It is difficult to evaluate the extent to which improperly cleaned and sterilized glassware and silverware may transmit disease, but it is certain that clean sterile glassware and silverware do not.

To determine the care used in preparing eating utensils, a survey was made in 1935 [4] with the aid of the Lansing Department of Health. Twenty-two restaurants were selected at random and without warning, swab samples were taken of both glassware and silverware, using a method of collection described later in this paper. in each restaurant. After making the survey of conditions as represented by the restaurants examined, an educational program was instituted on methods of obtaining clean sanitary utensils. Six weeks later without notification, the same restaurants were again visited and bacteriological examinations made. The results of these two surveys are presented in Table I.

The first survey shows how ineffectively eating utensils are cleaned and sanitized where regulations concerning sanitization [5] are not rigidly enforced. Surveys made by the writer in other cities show similar conditions. The second survey shows how effectively sanitization can be attained where restaurant owners are taught how to sanitize their utensils.

To aid the restaurant owners and sanitary enforcement officer in selecting the best method of cleaning and sanitizing eating utensils, a study of detergents and sanitizing agents was made. The data represent a preliminary report of this study.

* Read at a Joint Session of the Laboratory, Food and Nutrition, and Public Health Engineering Sections of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

* The word "sanitization" is used for want of a better term to describe the process of rendering eating utensils free from disease bacteria and other organisms indicative of insanitary conditions. The use of the word "sterilization" is incorrectly used when applied to eating utensils, because complete freedom of microscopic life is seldom attained and from a public health point certainly is unnecessary.

TABLE I

Survey of 22 Restaurants for Quality of Dishwashing

	Averaged Bacteria Counts of Tableware and Dishes			*Averaged Bacteria Counts of Tableware and Dishes*	
Restaurant	*Before Campaign*	*After Campaign*	*Restaurant*	*Before Campaign*	*After Campaign*
A	66,700	21	L	87,000	145
B	67,000	14	M	63,000	7
C	100,000	45	N	60,000	27
D	33,000	36	O	52,000	16
E	25,000	7	P	100,000	..
F	24	44	Q	34	35,000
G	37,000	10	R	8	56
H	17,000	..	S	378	6
I	3,000	1	T	2,300	1
J	100,000	..	U	20,000	3
K	8,000	7	V	100,000	3

DETERGENTS

The function of a detergent is to remove foreign materials from glassware and silverware without injury to the utensils or to the dishwashing equipment and the operators. The most frequently used detergents on the market for mechanical dishwashing contain one or more of the following ingredients: trisodium phosphate, sodium metasilicate, sodium carbonate, sodium hydroxide, and sodium hexametaphosphate.

Baker [5] in 1931 showed the merits of sodium metasilicate over trisodium phosphate, sodium hydroxide, and sodium carbonate detergents when each was tested separately. Schwartz and Gilmore [6] showed that the addition of sodium hexametaphosphate to dishwashing detergents prevents film formation, gives full value to detergent action, and yields results in respect to brightness and freedom from film superior to cleaners lacking this compound. They recommend a mixture consisting of 40 per cent sodium hexametaphosphate, 15 per cent trisodium phosphate, monohydrate, 40 per cent sodium metasilicate pentahydrate, and 5 per cent sodium hydroxide.

A good detergent is not only valuable for removing organic matter and film formation, but it should aid in the removal of microörganisms. Hall [7] compared trisodium phosphate with the mixture recommended by Schwartz and Gilmore in removing bacteria from dishes experimentally smeared with milk. The results are presented in Table II.

TABLE II

A Comparison of Schwartz and Gilmore Mixture and Trisodium Phosphate in Removing of Bacteria from Petri Dishes

Method of Cleaning	*No. of Organisms Remaining on Dish*
Water-control	300
Trisodium Phosphate	75
Schwartz and Gilmore Mixture	9

It will be observed that there were fewer bacteria remaining on the Petri dishes washed with the Schwartz and Gilmore mixture than with the dishes washed with trisodium phosphate.

Hall also tested the mixture recommended by Schwartz and Gilmore and a dishwashing compound, composed mostly of trisodium phosphate, in a

mechanical dishwasher under field conditions in two restaurants. The results are presented in Table III.

TABLE III

The Removal of Bacteria from Plates in Dishwashing Machine by Schwartz and Gilmore Mixture and Trisodium Phosphate

Restaurant	No. of Plates Tested	No. of Remaining Bacteria: Trisodium Phosphate	No. of Remaining Bacteria: Schwartz and Gilmore Mixture
A	270	19	8
B	333	7	1

The data show that in an examination of 603 dishes, the Schwartz and Gilmore mixture removed more bacteria than did trisodium phosphate. The writer in checking the removal of bacteria from glassware by detergents has obtained similar results.

GERMICIDAL PROPERTIES OF DETERGENTS

As the Schwartz and Gilmore mixture removed more bacteria than trisodium phosphate, a test of the germicidal properties of these compounds was made to determine whether the disappearance of the bacteria was due to destruction or loosening from the glassware by better detergent action. The technic used was the quantitative method of Mallmann and Devereux.[2] The detergents were examined at temperatures of 22°, 30°, 40°, 50°, 60°, and 70° C. The time intervals of exposure were 15, 30, 45, 60, 90, 120, and 180 seconds. A 24 hour culture of *Staphylococcus aureus* was used as test organism in all of the experiments. Although a number of detergents were tested only 3 will be presented: trisodium phosphate, sodium metasilicate, and the Schwartz and Gilmore mixture. All were tested in 1 per cent concentrations. The data for temperatures of 40, 50 and 60° C. for trisodium phosphate, sodium metasilicate, and Schwartz and Gilmore mixture are given in Tables IV, V, VI respectively.

All 3 detergents exhibited about the same amount of germicidal action. At 50° C. slight germicidal properties were demonstrated, but at 60° C. marked germicidal properties were evident. In 1 minute exposure, all *Staphylococcus aureus* organisms were killed, whereas a temperature of 60° C. in water alone required 3 minutes for sterilization. No difference could be detected among these 3 detergents, so the reduction in bac-

TABLE IV

The Germicidal Action of a 1 Per Cent Trisodium Phosphate at Various Temperatures, Using Staph. Aureus as a Test Organism

Temperature	Test Substance	Number of Surviving Bacteria at Various Periods of Exposure in Seconds: 15	30	45	60	90	120	180
40° C.	Trisodium Phosphate	43,000	31,000	63,000	63,000	44,000	50,000	52,000
	Control	38,000	40,000	38,000	42,000	40,000	39,000	41,000
50° C.	Trisodium Phosphate	11,000	14,000	19,000	20,000	18,000	15,000	2,000
	Control	41,000	37,000	57,000	40,000	33,000	31,000	33,000
60° C.	Trisodium Phosphate	3,000	50	0	0	0	0	0
	Control	18,000	11,000	2,400	2,000	1,600	10	0

TABLE V

The Germicidal Action of a 1 Per Cent Sodium Metasilicate at Various Temperatures, Using Staph. Aureus as a Test Organism

Temperature	Test Substance	Number of Surviving Bacteria at Various Periods of Exposure in Seconds						
		15	30	45	60	90	120	180
40° C.	Sodium Metasilicate	172,000	172,000	180,000	175,000	170,000	159,000	132,000
	Control	152,000	142,000	149,000	144,000	158,000	146,000	141,000
50° C.	Sodium Metasilicate	158,000	120,000	127,000	105,000	73,000	8,100	50
	Control	146,000	154,000	127,000	138,000	133,000	120,000	109,000
60° C.	Sodium Metasilicate	60,000	3,000	80	100	0	0	0
	Control	105,000	112,000	58,000	7,000	920	260	0

teria from dishes is not due to any added germicidal property of the Schwartz and Gilmore mixture.

The data of Hall and experiments by the writer indicate that the addition of sodium hexametaphosphate to a detergent mixture produces a preparation that cleans better as shown by the more effective removal of bacteria.

STERILIZING AGENTS

After dishes and silverware have been properly cleaned, they should be sanitized to render them free of all bacteria and other microörganisms. Two methods of sanitization or disinfection are in common use, hot water sterilization and chemical disinfection. The most common method for restaurant eating utensils is hot water, which is always used in mechanical dishwashers.

To check the efficiency of this method, a series of tests was made on dishwashers in use routinely in several restaurants and boarding clubs. The machines tested are operated at a temperature of not less than 145° F. in the washing compartment and not less than 170° F. in the rinsing chamber. The cleaner used was a detergent con-

TABLE VI

The Germicidal Action of a 1 Per Cent Schwartz and Gilmore Mixture at Various Temperatures, Using Staph. Aureus as a Test Organism

Temperature	Test Substance	Number of Surviving Bacteria at Various Periods of Exposure in Seconds						
		15	30	45	60	90	120	180
40° C.	S. & G. Mixture	111,000	112,000	85,000	97,000	95,000	95,000	91,000
	Control	90,000	100,000	98,000	95,000	101,000	101,000	99,000
50° C.	S. & G. Mixture	88,000	84,000	70,000	47,000	17,000	13,000	6,400
	Control	45,000	38,000	39,000	25,000	27,000	18,000	8,700
60° C.	S. & G. Mixture	54,000	9,000	170	0	0	0	0
	Control	104,000	81,000	25,000	16,000	2,000	300	0

sisting mostly of trisodium phosphate. Samples were collected daily for 13 days. Forks, knives, spoons, glasses, cups, sidedishes, and saucers were generally checked, but in some instances other dishes were also examined. Cotton swabs were placed in 10 ml. of sterile salt solution. Before swabbing, the excess water was removed from the swab by pressing against the tube. Saucers and sidedishes were tested by swabbing an area of 1½" square. Cups and glasses were checked by swabbing the rims of the utensil on the inside and outside. Forks, knives and spoons were checked by swabbing the tines, blade, and bowls respectively on both sides. After shaking the swab in the rinse water, 1 ml. portions were plated on plain nutrient agar and incubated at 37° C. for 48 hours. This technic is similar to that used routinely in this laboratory for checking restaurants, soda fountains, and beer gardens, except that the swabs supplied to the inspectors are dampened with 0.25 ml. of salt solution instead of 10 ml. The larger amount of salt solution on the swab at the time of sampling was selected merely to lessen the laboratory work.

Utensils from 4 college operated boarding clubs were examined. These were selected because of close supervision by a representative of the Department of Home Economics who is in charge. It was felt that the results obtained from these dishwashers would represent the ideal as far as attainable results were concerned. The data obtained are presented in Table VII. As shown, the average bacteria count per unit utensil was 16, 9, 21, and 11 bacteria respectively for Mary Mayo Hall, Wells Hall, Woman's Building, and the Union Cafeteria.

A large privately owned restaurant was also checked. This is very carefully supervised and represents, as far as care is concerned, an ideal in handling of dishes. The method of handling the dishes and silverware is the same as found in any restaurant using a mechanical dishwasher. The results are presented in Table VIII. It will be observed that the average count for all units is 17 bacteria; also, that the medium count is extremely low.

Most of the colonies found on the dishes and silverware represented spore-bearing bacteria which are quite resistant to heat. The presence of these organisms, particularly in such small numbers, is of no sanitary significance. On the basis of these data, it appears that hot water at a temperature of 170° F. is sufficient to effect satisfactory sanitization of all restaurant dishes and silverware. I believe that a utensil with a bacterial count less than 100 colonies is a dish that has been properly washed and sanitized. The production of absolute sterilization is impractical and unnecessary.

I do not believe that chemical treatment should be recommended where hot water is available, or that chemicals

TABLE VII

An Averaged Bacterial Count of 8 Different Eating Utensils in 4 College-Operated Boarding Clubs, Using Hot Water Sanitization

	Bacterial Counts							
	Fork	*Knife*	*Spoon*	*Glass*	*Cup*	*Sidedish*	*Saucer*	*Total Average*
Mary Mayo Hall	20	80	0	0	10	10	10	16
Wells Hall	0	0	0	0	10	50	0	9
Woman's Bldg.	20	0	110	40	0	0	0	21
Union Cafeteria	20	30	0	0	20	0	10	11

TABLE VIII

Bacterial Counts of 13 Eating Utensils, in a Large Restaurant, Using Machine Washing with Hot Water Sanitization

	Bacterial Count			
Utensil	*Low*	*High*	*Medium*	*Average*
Water glass	0	1,080	10	18
Cup	0	200	0	22
Saucer	0	90	20	27
Plate	0	90	0	11
Salad dish	0	5,000	20	31
Soup bowl	0	350	30	18
Side dish	0	1,280	10	26
Cocktail glass	0	10	0	5
Cream pitcher	0	0	0	0
Fork	0	60	0	14
Knife	0	3,100	0	27
Teaspoon	10	160	10	20
Soup spoon	0	20	0	20
Grand average				17

should supplement the hot water processes in any way. If the operator knows that chemicals capable of killing are in his washing compounds, he is very apt to depend upon the chemicals rather than heat. Unless the dosage of the preparation is right, unsatisfactory results are apt to occur. Heat properly applied is effective and there is no need of a supplementary disinfectant. Where hot water is unavailable, as frequently occurs in beverage dispensing establishments, chemical disinfection is necessary. For such a place chemical disinfection should be used, although hot water should be recommended and the proprietors should be urged to arrange for the hot water process as the ideal method.

The only practical chemical disinfectants that have come to my attention have been the chlorine compounds, particularly those containing hypochlorites (Devereux and Mallmann). Chloramine T and azochloramid preparations are satisfactory, providing a sufficient exposure is used.

All chemical disinfectants used for glass should be easily checked by a simple test for concentration by sanitary inspectors; otherwise the operators are very apt to use too little for satisfactory results. I found that, unfortunately, a chemical test alone for concentration of the disinfectant is not sufficient. Frequently, the attendants will by-pass the disinfectant solution to avoid the odor of the compound on the glasses. To insure proper sanitization it is necessary to check the glasses bacteriologically through swab examinations. In Lansing and East Lansing, we are doing this routinely and have found it very satisfactory and easily conducted.

CONCLUSION

1. Certain detergents remove bacteria more efficiently from glassware than others. The addition of sodium hexametaphosphate to detergent mixtures, aids in the removal of bacteria.

2. Hot water under practical routine conditions provides satisfactory destruction of bacteria on dishes and silverware. It is recommended that wash waters be maintained at a temperature of at least 140° F. and rinse waters at a temperature of not less than 170° F.

Chemical disinfection should be rec-

ommended only when hot water is not available.

For cold water disinfection, only chlorine sterilizers should be used, or comparable compounds that can be readily checked by simple chemical tests.

All glassware and silverware should be checked routinely by bacteriological examinations.

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Full-Time County Health Units in Maryland

MARYLAND, according to Dr. R. H. Riley, Director of the State Department of Health, has the distinction of being the first state in the Union to have established a full-time health unit in all counties with the financial support of the local community before Social Security or other federal funds were available.

When the State Department of Health was organized in 1874, cities and counties were functioning independently. A significant advance was made in 1914 when the State Legislature authorized the creation of 10 sanitary districts. The districts consisted at first of two or three counties, each in charge of a full-time deputy state health officer.

As early as 1915 the activities and responsibilities had so increased that full-time health service for each county became not only desirable, but necessary.

In 1922 the first full-time county health department was established in Allegany County. By 1928, 9 counties had accepted the county unit plan. By Act of Legislature in 1931, the state was divided into 23 sanitary districts, each county forming a district. During 1933 Caroline County accepted the full-time county health unit plan, giving Maryland the distinction of having a full-time health unit with trained personnel in every county of the state, thereby in the space of 12 years accomplishing what at first seemed an impossible task.

Intestinal Parasite Survey in Alabama

I. A Comparative Study of Two Hookworm Anthelmintics*

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DURING the past 2 years a hookworm survey has been in progress in Alabama. The majority of school children in 36 of the 67 counties in the state have been examined, while the other 31 counties will have completed their surveys during the 1936–1937 scholastic year. This paper is the first of a series concerning intestinal parasites in Alabama.

For more than 10 years the Alabama State Department of Health has used the combination drug carbon tetrachloride-oil of chenopodium, in proportions of 2 to 1, in the treatment of hookworm infestation and disease. The introduction and widespread employment of tetrachlorethylene as an anthelmintic in the treatment of hookworm infestation, instigated a comparative study of these two drugs. This investigation was designed primarily to substantiate the continued use of carbon tetrachloride-oil of chenopodium compound as the drug of choice, or the substitution of tetrachlorethylene as the official anthelmintic to be recommended by the Department of Health.

HISTORICAL

Hall [1] (1926) states "anthelmintic medication underwent a very slow evolution up to less than a half century ago, at which time there was a rather rapid acceleration in the way of developments, and events during the past 10 years indicate that we are now entering a third stage in the development of this subject. The first stage covers centuries of uncritical empiricism; the second stage covers less than a half century of increasingly critical empiricism; and the third stage covers a decade of critical experimental investigation." The literature indicates that male fern, which was known to the Greeks, is the oldest anthelmintic.

Thymol was proposed in 1881 and proved superior to male fern in hookworm disease. At the same time oil of chenopodium was introduced in Europe but did not gain full recognition until 1913. Hall [2] (1921) introduced carbon tetrachloride in canine hookworm disease. Leach and his associates [3, 4] (1922, 1923) in two reports showed its value for human treatment.

Smillie and Pessoa [5] (1922) were the first to use a combination of carbon tetrachloride and ascaridol, which is the active principle of oil of chenopodium.

* Read before the Laboratory Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

They claimed that carbon tetrachloride was more effective against female hookworm, and ascaridol better for male hookworm. Hall and Shillinger [6] (1925) introduced tetrachlorethylene and found it to be as effective as carbon tetrachloride and about as safe.

EXPERIMENTAL

(a) Methods—Field—It was decided to work in certain southern rather than northern counties in order to have an adequate and comprehensive sample. The hookworm survey of Havens and Castles [7] (1930) showed that more children were infested and heavier infestations were encountered in the southern counties than in the northern ones. School children were selected as the group most easily accessible and and offering the best possibility of securing a sufficiently adequate sample from which to draw conclusions. In the beginning every tenth positive specimen for hookworm had an egg count in order to determine the average worm burden per child. Later an egg count was made on every positive specimen when enough material was submitted. The two drugs were alternated with the children showing positive specimens, and this alternation was continuous from school to school and county to county. A recheck fecal specimen was submitted 10 days to 2 weeks after treatment in most incidences; 5 weeks was set as the maximum time for submission of rechecks in order to avoid error from reinfestation.

The dosage was as follows:

Carbon tetrachloride (2 parts)—Oil of Chenopodium (1 part): 3 min. per year of age with 30 min. as the maximum dose.

Tetrachlorethylene: 0.2 c.c. per year of age with 3.0 c.c. as the maximum dose.

The drugs were obtained from the manufacturers in gelatin capsules. The treatment for each child was put up in a separate envelope in the central office, and distributed through the county health officer for home administration. No rechecks were made unless it had been ascertained that the child had taken the treatment.

(b) Methods — Laboratory — All specimens were examined for intestinal parasites by the salt flotation method in the various laboratories belonging to the state system. At the beginning of the study every tenth positive specimen was sent to the Central Laboratory in Montgomery, where egg counts were made. Subsequently, because so many positive specimens had insufficient amount of feces, all positive samples were examined whenever possible. The same two technicians performed all egg counts. The Caldwell technic was used rather than the Stoll. This method was described by Caldwell and Caldwell [8] (1926) and has been used in these laboratories since its inception.

(c) Presentation of Data—The 6 counties shown on Map I are those included in this study. The percentage

MAP I

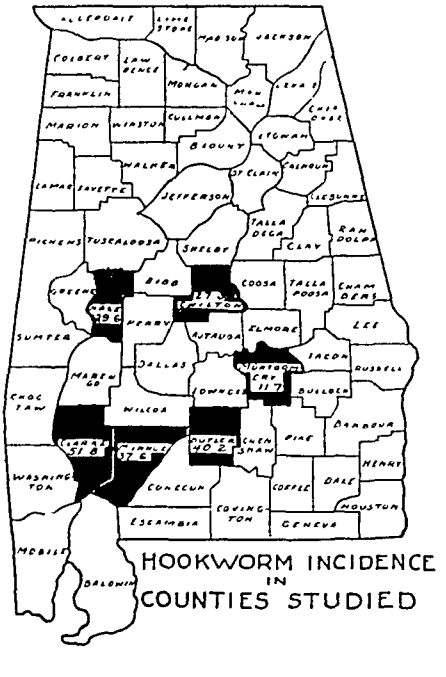


TABLE I

Hookworm Incidence by Age, Sex and Race in the Area Surveyed

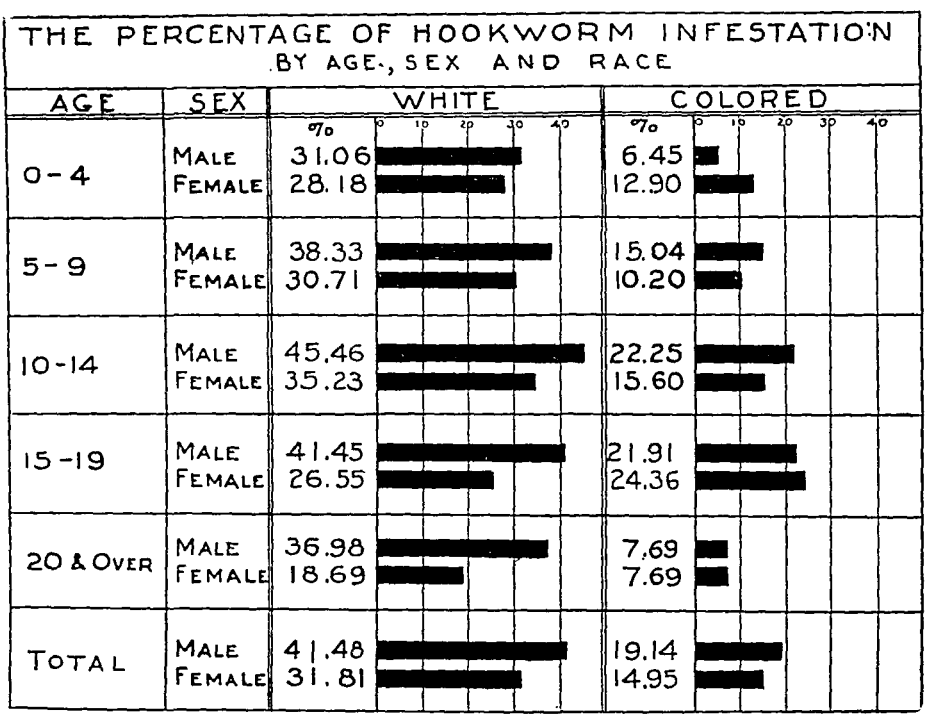
	White				Colored			
	Male		Female		Male		Female	
Age	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.
0- 4	41	91	31	79	2	29	4	27
5- 9	836	1,345	691	1,559	85	480	59	519
10–14	1,109	1,330	894	1,643	142	496	127	687
15–19	286	409	167	462	39	139	48	149
20 and over	27	46	23	100	1	12	3	36
Age not stated	9	35	6	41	9	18	10	9
Grand Total	2,308	3,256	1,812	3,884	278	1,174	251	1,427

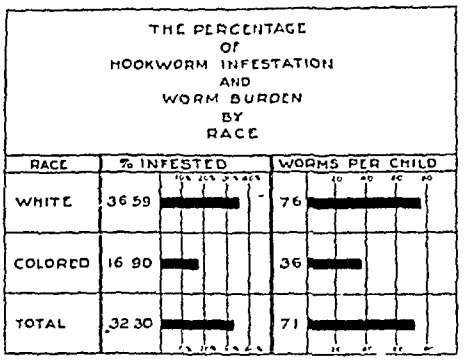
of infestation is shown for each county. It will be noted that those south of Montgomery have a higher percentage of infestation than Montgomery and the 2 northern counties.

Table I and Chart I show the number with percentage, of infestation by race, sex, and age. In the white group it is apparent that there is higher infestation in males for all age groups, and the age groups 10–19 are the ones most heavily involved. The infestation rate among the colored is much lower, with the incidence in the colored female heavier than in the male in the age group 15–19.

Chart II shows the infestation rate for all ages and both sexes by race with the average worm burden. The infestation, as is expected, in the colored is less

CHART I





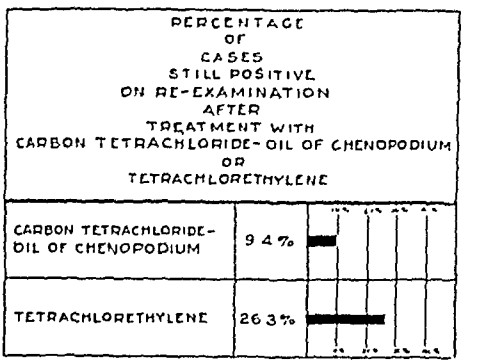


TABLE II

The Results of Reëxamination of Positive Cases Following Carbon Tetrachloride-Oil of Chenopodium or Tetrachlorethylene Treatment

Carbon Tetrachloride-Oil of Chenopodium			*Tetrachlorethylene*		
No. Pos.	*No. Neg.*	*Per Cent Pos.*	*No. Pos.*	*No. Neg.*	*Per Cent Pos.*
82	786	9.4	243	680	26.3

than one-half that of the white group. Similarly, the average worm burden is smaller.

Table II and Chart III show the number and percentage of children on reëxamination, after treatment with carbon tetrachloride-oil of chenopodium and tetrachlorethylene, who remained positive for hookworm. There were about 3 times as many children showing hookworm ova after tetrachlorethylene as there were after carbon tetrachloride-oil of chenopodium treatment. This is statistically significant.

DISCUSSION

There were 14,622 specimens examined from the 6 counties. Of these 4,728, or 32.3 per cent, were found positive for hookworm. The Rockefeller Sanitary Commission[9] (1914) after surveying 30 counties in Alabama reported an infestation rate of 53.6 per cent. Recheck specimens were received from 868 children who had taken carbon tetrachloride-oil of chenopodium, and from 923 children who had taken tetrachlorethylene. Of the 868 children taking carbon tetrachloride-oil of chenopodium 82 remained positive, whereas 243 of the 923 children taking tetrachlorethylene still showed hookworm ova. This differentiation in favor of the combined treatment is statistically significant. The number of positive rechecks having egg counts was so small that a comparison of the two drugs in the reduction of the degree of infestation was impossible.

Soper[10] (1926) working in Paraguay reports as follows: "Comparative results presented for tetrachlorethylene and carbon tetrachloride given in equal doses and under similar conditions show that carbon tetrachloride alone or in combination with oil of chenopodium is more efficient for *Necator* than is tetrachlorethylene and that in combination with oil of chenopodium, carbon tetrachloride is more efficient than is tetrachlorethylene for *Ancylostoma*."

CONCLUSIONS

The combination of carbon tetrachloride and oil of chenopodium (in the proportion 2 to 1) in the dosages used

in this experiment proved more efficacious than tetrachlorethylene in the treatment of hookworm infestation.

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Is the Trailer a Health Menace?

HIGHWAY safety, sanitation and other problems growing out of the increasing use of house trailers held the spotlight throughout the 2 day meeting of the Second Regional Conference on Highway Safety held recently in New York City.

Legislators and administrative officers of 8 states, together with representatives of several national agencies, attended the conference which was called by the New York Joint Legislative Committee on Interstate Coöperation in conjunction with the Council of state governments to determine the need if any for regulatory legislation with respect to house trailers. The states represented were Delaware, New Jersey, New York, Pennsylvania, Connecticut, Massachusetts, Vermont and Ohio.

Discussion during the conference led to the conclusion that at present there is a lack of basic information on which to draft legislation. It was agreed that the several states be requested to withhold regulatory legislation pending development of a uniform measure and that a study be made of the various phases of the problem, including sanitation. A committee was appointed to make the proposed study and to report at the meeting of the Regional Conference next year.—*Health News*, State Dept. of Health, Albany, N. Y., Mar. 29, 1937.

Appraising the Educational Content of a Health Service Program*

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THE White House Conference *Report on the School Health Program*, enunciates a number of fundamental guiding policies. Many of these have had their influence on the school health programs of the country. The subject of this paper is prompted by the acceptance of one of these principles, which is: "The health program of the schools should be definitely and fundamentally educational in nature and scope."

In using the term "health service program" we are including the following activities: (1) There are the medical and dental examination programs with the subsequent follow-up of cases with physical defects; (2) those activities which are carried on for the purpose of preventing the spread of communicable diseases; (3) the first aid and emergency treatments; (4) the special advisory functions of the doctor and nurse relative to adjustments in the school routine to benefit children with certain physical handicaps, such as cardiac disorders, hearing and vision defects.

What are the educational values one might expect from a health service program? We must know these before proceeding to any appraisal. Biologically defined, education is a change in the organism resulting from activity. From this standpoint the health service program has an educational influence on all of those who participate in it. There are changes not only in the child but in all others concerned—the parent, the teacher, the nurse, the principal, the physician, the dentist and the dental hygienist. Changes that take place may be desirable or undesirable. Are any of our programs conducted in such a way that the educational values, such as favorable attitudes and proper health habits, results? or are we merely paying lip service to an ideal, and possibly developing unfavorable attitudes toward medical service and advice? The answer to these questions rests on a critical evaluation of our procedures.

The first essential in evaluating a program is to define its objectives specifically. Unless we know exactly what we are trying to achieve, measurement is impossible. Values must be measured in terms of the degree to which specific objectives are attained.

Some of the desired educational values for the child are:

* Read at a Joint Session of the Public Health Education and the Child Hygiene Sections of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

1. A favorable attitude toward professional medical and dental care.
2. An appreciation of the value and importance of early medical advice and the dangers of self-medication and over-the-counter drug store prescribing.
3. Information concerning the transmission of communicable diseases, methods of protection, and proper health behaviors relative to their control.
4. The development of good health habits. The advice received from professional personnel at the time of the examination should be a potent influence toward improving the health behaviors of the child.
5. A respect for the achievements of medical science and an appreciation of the work that is continually being attempted in connection with the control of disease.

Not only does the school health program have a responsibility to the child, but if it is to achieve one of its main functions, namely, the amelioration of handicaps among the children served, then it must educate the parents in a number of important ways. These are:

1. It should produce a better understanding of the child not only with respect to his physical needs, but also his mental and social needs. Either at the time of the examination or in the course of the follow-up the specific needs of the child should be made clear to the parent.
2. It should inform parents concerning the medical facilities of the community and how they can best be used. It should also teach both parents and children how to appraise the various types of so-called medical facilities, or, in other words, how to separate the quacks from reputable and acceptable facilities. Too often, the program concentrates on the attainment of only one of the desirable results—the correction of a defect—and ignores the concomitant bad result that accrues from the way in which the attempt at correction is made. The purchase of glasses from the 10 cent store is sometimes considered a correction by the parent
3. It should develop among parents a favorable attitude toward the school, so that they will think of it as a place where they can go for friendly advice concerning their child instead of waiting for the school to come to them.
4. From the program, parents should develop a favorable attitude toward all preventive measures, such as, immunizations and vaccinations, early care of colds, etc. The emphasis upon perfect attendance has done much in a negative and undesirable health educational way. There are times when children ought to be absent.

Since the teacher is a participant in the school health program, we may also expect her to reap certain educational values. These are:

1. A better understanding of the handicaps of children in general and of her children in particular. If the teacher assumes certain responsibilities for screening out children who should be seen by physicians as early as possible and, if she is present at the examination of those children, then she feels that she has a responsibility for the health of the children in her room. On the other hand, if the medical service is conducted without the teacher, she learns that some one else has the responsibility for the health of the children and that it is not her function.
2. An improved knowledge of the meaning of certain physical symptoms and behaviors which she may observe in her children.
3. A more thorough understanding of the home conditions of the children whose homes are visited by any of the school health personnel. How many school nurses report back to the teacher on the home environment of a child she has visited so that proper curriculum and other adjustments can be made?
4. A knowledge of how to utilize the services of the other members of the school health staff in understanding her own children In a properly coördinated program the teacher should learn when to rely on her own judgement and when to call upon the physician or nurse and how to utilize their time to the best advantage.

During the nurse's participation in the program certain educational values should also accrue to her. One of these should be an appreciation of the fact that children are more than objects with physical defects that must be corrected, and that her job is a teaching job with the parent, more than a coercive job of getting children under medical care. To this end the nurse must learn the scholastic and social problems of the child as well as his physical condition. As a second educational value the nurse

should learn that she is a part of the total situation and that the work that she does and the records that she keeps are merely a means to an end, rather than an end in themselves.

In a properly functioning school health program, the principal also is a participant and as a result of his participation there are certain educational outcomes that should be expected. First of all, he should gain an appreciation of the need for administrative adjustment for children with specific handicaps. The principal should also learn the limitations of a school medical examination. It is impossible under the present organization of the school medical service to give periodic health examinations to all of the children. School medical examinations cannot be as accurate as we would hope because the previous history of the child is seldom available. Therefore, we cannot expect the physician to give the type of medical service that might be expected from a private physician with his own patients. These limitations should be recognized by the principals in order that demands will not be made upon school physicians to do the impossible.

These are some of the many educational outcomes that may be expected from a well rounded program of school health service. How can we evaluate the extent to which these outcomes have been attained? In the past, expert opinion has frequently been used in the evaluation of various public health programs. By this method an individual, or a group of individuals, studies the program, its objectives, the administrative organization, and the activities carried on. From this study the experts state in more or less qualitative terms their opinions concerning the effectiveness of the program in achieving its objectives. There are several dangers in this method of evaluation. First, the estimate of the success of the program depends upon the expert or experts who make the evaluation. If a physician evaluates the problem, his judgments will be largely based upon the adequacy of the examination, the length of time that it takes to make it, and the relative number of children so examined. It is probable that he will give less attention to the follow-up and educational activities in the program. If, on the other hand, the evaluation is made by a health education expert, much more emphasis will be placed upon the educational content of the curriculum and the extent to which the examination is used as a teaching experience.

Realizing these dangers inherent in evaluation by expert opinion, those who critically study public health procedure have turned to appraisal forms and rating scales as methods of overcoming some of the bias likely to result from expert opinion. Such appraisal forms consist of a number of items that experts agree should be present in a good health program. Specific numerical values are granted for the presence of each of the items in the appraisal form, and the evaluation is made by summing up the scores for each of the items carried on in the program. This largely eliminates the failure to obtain a comprehensive picture of a school health program. It likewise eliminates the errors that arise because of the difference in emphasis which various experts attach to particular activities. It does not, however, remove the difference in standard in the observaton. For example, items in an appraisal form, such as "Provision for integration of health topics with other subjects of the curriculum," or "Satisfactory evidence of special adjustment of school régime to meet needs of children with heart defects," are specific items; but the decision as to whether the adjust-

ment of the school régime is satisfactory or whether the integration of health topics into the curriculum is provided for, will depend upon the standard used by the evaluator to judge satisfactoriness and integration. The personal equation still is a factor.

Furthermore, these appraisal forms focus their emphasis upon administrative practices rather than upon results. A school that is following all of the prescribed procedures would be evaluated as having a very acceptable program even though many of the objectives listed are not being obtained. Despite these limitations, appraisal forms have been very useful. They have called attention to many of the lacks in school programs, and this has frequently led to improvements.

An adequate evaluation depends on the measurement of the actual results obtained. Do children who have been under a given health service follow preventive measures? Do they realize the values of early medical advice and the dangers of self medication? Do they go to a dentist regularly? Answers to such questions should be the essence of a proper evaluation.

However, it is not easy to obtain answers. To do so requires measurement of knowledge, attitudes and behavior of children, of parents, of teachers, of nurses, of physicians and of principals. Only a few of the measurements needed to provide answers to these questions have been devised. Their construction is a long, careful research problem in itself. Therefore, we cannot be expected to describe comprehensive measurements suitable for evaluating present health service programs. All we can now do is to outline the criteria for such measurements.

First, the measurements must be objective. They must be so constituted that the results obtained by one evaluator will be the same as those by any other evaluator in the same situation. If this condition is not met by the measurements, the results obtained are indicative of the person who made the evaluation, and not of the program. Evaluations based on individual subjective judgments are especially faulty when judged by this criterion.

Second, the test items must be indicative of the total objective rather than a measurement only of the particular items included. Suppose we were measuring the extent to which the program had produced in the children favorable attitudes toward health behaviors. It would, of course, be impossible to measure the children's attitudes toward every possible health behavior. Therefore the materials chosen for measuring children's attitudes must be so selected that they represent more than just the particular items included. In other words, if another section of the materials were used the same distinctions in the children's attitudes would be obtained. Those in the public health field have been too prone to place significance on the answers to individual questions. The psychologists ask a group of questions bearing on the point at issue and judge the mass effect of the replies. We must become accustomed to using questions and answers as indices and not for their individual significance. Answers vary too much with the way questions are asked. We must get at the truth by indirect rather than by direct approaches.

Third, the measurements used must be truly indicative of the degree to which the objectives have been achieved. Satisfying this criterion is particularly difficult as many of the most important educational values of the health service program do not exhibit themselves until later in life. For example, one of the most important outcomes should be an appreciation of medical supervision and a tendency to seek medical advice on

health problems. Direct measurement of the attainment of that objective cannot be made until several years after the child has been exposed to the program. Therefore, any immediate evaluation of attainment must be by indirect measurement of a child's behavior under artificial situations; but this indirect measurement must first be shown to be indicative of the actual subsequent behavior of the child—otherwise the evaluation is not valid.

The health service program can be definitely and fundamentally educational. We may think that the direct, immediate and only outcome of an examination is the correction of defects. Occasionally it may be, but in many instances the specific physical condition disclosed in an examination is relatively minor. It is merely a practical demonstration of a desirable procedure. The school medical service cannot be at a child's beck and call every minute. The service must teach something. If it does not teach something that the child can use later, it is merely palliative, and little progress is to be expected.

We are not getting all the educational value possible out of the health service program. We are too impatient; our objective is too limited; our eyes are too narrowly focused on the defect. We do not want to slow up the examination to talk to children or to parents. It cuts into our number of examinations. This is a mistake. We must raise our eyes to the long-time educational outcomes of the health service experience. The tooth that we repair today is just one little experience. The school cannot accept the responsibility for all future repair work. The aim should be to get the child and the family to accept the responsibility in the future for their own good and of their own volition.

Once the educational values are utilized in the school health program, then evaluation is worth while to guide procedures. Accurate appraisal is a slow, painful process but it is worth the effort. We must seek the aid of experts in psychological measurement to do the pioneering research in the construction of measuring instruments. Practical evaluation procedures must await these preliminaries.

Uses of the Life Table in Vital Statistics*

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FOR the benefit of those readers who may not be acquainted with the detailed structure of the life table, a brief description of its principal columns will first be given, using, by way of illustration the life table for white males in the United States in 1934, as computed in the Statistical Bureau of the Metropolitan Life Insurance Company. This table is reproduced as Table I.

Column 1 of this table gives the age of life from birth to age 104. The second column shows the survivors to each age of life out of 100,000, starting out at birth (age 0), and diminishing from age to age in accordance with the mortality of 1934. The figures in this column are generally denoted by the symbol l_x. The third column indicates the corresponding deaths in each year of life, the figures in this column, usually denoted by d_x, being simply the differences between two adjacent figures in the second column. The fourth column gives the death rate in each year of life, or, to be more exact, the probability at a given age of dying within 1 year, this being denoted by the symbol q_x. So, for example, the death rate at age 10 is obtained by dividing the deaths in this year of life, namely 123, by the number of persons entering this age, namely 91,625. This quotient, expressed in parts of a thousand, is 1.34.

The fifth and sixth columns are auxiliary columns employed in computing the seventh column, which gives the expectation of life at each year of age. The fifth column gives the average number of persons living in each year of life; for instance, in the first line opposite age 0, we find 97,090 which is the average of 100,000 and 94,179. The figures in this column may also be interpreted as the number of years of life lived within a given age of life; so, for instance, the figure 97,090 is the number of years lived by the survivors of the original 100,000 in passing through the first year of their life.

Column 6 is obtained by cumulating the figures in column 5 beginning at the end; for example, the figure 31 in column 6 opposite age 100 is the sum of 2+4+8+17, the figures appearing on the same line and the lines below in column 5.

Lastly, column 7, as already noted, gives the expectation of life or the average after-lifetime at each year of life. It is obtained as the quotient of the figures in column 6 and the corresponding figures in column 2, for this gives a total number of years lived by survivors of a cohort after a given age, divided by the number of persons entering that age.

A table such as this, it is seen at once, contains a great deal of detailed information and is a source from which

* Read before the Vital Statistics Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

TABLE I

Life Table for White Males in the United States, 1934

1	2	3	4	5	6	7
	Of 100,000 Born Alive		*Rate of Mortality per 1,000*			
Age x	*Number Surviving to Exact Age x* l_x	*Number Dying Between Ages x and x+1* d_x	*Number Dying Between Ages x and x+1 Among 1,000 Living at Age x* $1{,}000q_x$	*Number of Years Lived by the Cohort Between Ages x and x+1* L_x	*Total Number of Years Lived by the Cohort from Age x on, Until All Have Died* T_x	*Complete Expectation of Life or Mean After-Lifetime; Average Number of Years Lived After Age x per Person Surviving to Exact Age x* $\mathring{e}_x$
0	100,000	5,821	58.21	97,090	6,023,954	60.24
1	94,179	840	8.92	93,759	5,926,864	62.93
2	93,339	413	4.43	93,133	5,833,105	62.49
3	92,926	287	3.09	92,783	5,739,972	61.77
4	92,639	226	2.44	92,526	5,647,189	60.96
5	92,413	191	2.07	92,318	5,554,663	60.11
6	92,222	172	1.87	92,136	5,462,345	59.23
7	92,050	158	1.72	91,971	5,370,209	58.34
8	91,892	139	1.51	91,823	5,278,238	57.44
9	91,753	128	1.39	91,689	5,186,415	56.53
10	91,625	123	1.34	91,564	5,094,726	55.60
11	91,502	124	1.35	91,440	5,003,162	54.68
12	91,378	129	1.41	91,314	4,911,722	53.75
13	91,249	139	1.52	91,180	4,820,408	52.83
14	91,110	150	1.65	91,035	4,729,228	51.91
15	90,960	165	1.81	90,878	4,638,193	50.99
16	90,795	181	1.99	90,705	4,547,315	50.08
17	90,614	196	2.16	90,516	4,456,610	49.18
18	90,418	212	2.34	90,312	4,366,094	48.29
19	90,206	226	2.51	90,093	4,275,782	47.40
20	89,980	239	2.66	89,861	4,185,689	46.52
21	89,741	251	2.80	89,616	4,095,828	45.64
22	89,490	260	2.91	89,360	4,006,212	44.77
23	89,230	268	3.00	89,096	3,916,852	43.90
24	88,962	273	3.07	88,826	3,827,756	43 03
25	88,689	278	3.14	88,550	3,738,930	42.16
26	88,411	283	3.20	88,270	3,650,380	41.29
27	88,128	289	3.28	87,984	3,562,110	40.42
28	87,839	297	3.38	87,691	3,474,126	39.55
29	87,542	307	3.51	87,389	3,386,435	38.68
30	87,235	318	3.65	87,076	3,299,046	37.82
31	86,917	332	3.82	86,751	3,211,970	36.95
32	86,585	347	4.01	86,412	3,125,219	36.09
33	86,238	365	4.23	86,056	3,038,807	35.24
34	85,873	383	4.46	85,682	2,952,751	34.38
35	85,490	403	4.71	85,289	2,867,069	33.54

TABLE I (Cont.)

Life Table for White Males in the United States, 1934

1	2	3	4	5	6	7
	Of 100,000 Born Alive		*Rate of Mortality per 1,000*			*Complete Expectation of Life or Mean After-Lifetime; Average Number of Years Lived After Age x per Person Surviving to Exact Age x*
Age	*Number Surviving to Exact Age x*	*Number Dying Between Ages x and x+1*	*Number Dying Between Ages x and x+1 Among 1,000 Living at Age x*	*Number of Years Lived by the Cohort Between Ages x and x+1*	*Total Number of Years Lived by the Cohort from Age x on, Until All Have Died*	
x	l_x	d_x	$1{,}000q_x$	L_x	T_x	e_x
36	85,087	424	4.98	84,875	2,781,780	32.69
37	84,663	445	5.26	84,441	2,696,905	31.85
38	84,218	467	5.55	83,985	2,612,464	31.02
39	83,751	492	5.87	83,505	2,528,479	30.19
40	83,259	518	6.22	83,000	2,444,974	29.37
41	82,741	548	6.62	82,467	2,361,974	28.55
42	82,193	581	7.07	81,903	2,279,507	27.73
43	81,612	620	7.60	81,302	2,197,604	26.93
44	80,992	663	8.19	80,661	2,116,302	26.13
45	80,329	709	8.83	79,975	2,035,641	25.34
46	79,620	759	9.53	79,241	1,955,666	24.56
47	78,861	809	10.26	78,457	1,876,425	23.79
48	78,052	861	11.03	77,622	1,797,968	23.04
49	77,191	914	11.84	76,734	1,720,346	22.29
50	76,277	968	12.69	75,793	1,643,612	21.55
51	75,309	1,022	13.57	74,798	1,567,819	20.82
52	74,287	1,077	14.50	73,749	1,493,021	20 10
53	73,210	1,133	15.47	72,644	1,419,272	19.39
54	72,077	1,191	16.53	71,482	1,346,628	18.68
55	70,886	1,255	17.70	70,259	1,275,146	17.99
56	69,631	1,326	19.04	68,968	1,204,887	17.30
57	68,305	1,406	20.59	67,602	1,135,919	16 63
58	66,899	1,496	22.36	66,151	1,068,317	15.97
59	65,403	1,591	24.33	64,608	1,002,166	15 32
60	63,812	1,688	26.46	62,968	937,558	14.69
61	62,124	1,783	28.70	61,233	874,590	14.08
62	60,341	1,872	31.02	59,405	813,357	13.48
63	58,469	1,952	33.39	57,493	753,952	12.89
64	56,517	2,028	35.89	55,503	696,459	12.32
65	54,489	2,103	38.60	53,438	640,956	11.76
66	52,386	2,181	41.64	51,296	587,518	11.21
67	50,205	2,264	45.09	49,073	536,222	10.68
68	47,941	2,350	49.02	46,766	487,149	10.16
69	45,591	2,435	53.41	44,374	440,383	9.66

TABLE I (Cont.)

Life Table for White Males in the United States, 1934

1	2	3	4	5	6	7
	Of 100,000 Born Alive		*Rate of Mortality per 1,000*			
Age	*Number Surviving to Exact Age x*	*Number Dying Between Ages x and x+1*	*Number Dying Between Ages x and x+1 Among 1,000 Living at Age x*	*Number of Years Lived by the Cohort Between Ages x and x+1*	*Total Number of Years Lived by the Cohort from Age x on, Until All Have Died*	*Complete Expectation of Life or Mean After-Lifetime; Average Number of Years Lived After Age x per Person Surviving to Exact Age x*
x	l_x	d_x	$1{,}000q_x$	L_x	T_x	$\mathring{e}_x$
70	43,156	2,511	58.19	41,901	396,009	9.18
71	40,645	2,573	63.30	39,359	354,108	8.71
72	38,072	2,616	68.70	36,764	314,749	8.27
73	35,456	2,636	74.34	34,138	277,985	7.84
74	32,820	2,634	80.27	31,503	243,847	7.43
75	30,186	2,613	86.55	28,880	212,344	7.03
76	27,573	2,571	93.25	26,288	183,464	6.65
77	25,002	2,511	100.42	23,747	157,176	6.29
78	22,491	2,432	108.15	21,275	133,429	5.93
79	20,059	2,337	116.51	18,891	112,154	5.59
80	17,722	2,226	125.63	16,609	93,263	5.26
81	15,496	2,101	135.59	14,446	76,654	4.95
82	13,395	1,962	146.49	12,414	62,208	4.64
83	11,433	1,811	158.42	10,528	49,794	4.35
84	9,622	1,649	171.36	8,798	39,266	4.08
85	7,973	1,477	185.28	7,235	30,468	3.82
86	6,496	1,300	200.15	5,846	23,233	3.58
87	5,196	1,122	215.95	4,635	17,387	3.35
88	4,074	948	232.64	3,600	12,752	3.13
89	3,126	782	250.21	2,735	9,152	2.93
90	2,344	630	268.65	2,029	6,417	2.74
91	1,714	494	287.95	1,467	4,388	2.56
92	1,220	376	308.10	1,032	2,921	2.39
93	844	278	329.13	705	1,889	2.23
94	566	199	351.22	467	1,184	2.09
95	367	137	374.62	299	717	1.94
96	230	92	399.54	184	418	1.81
97	138	59	426.23	109	234	1.68
98	79	36	454.89	61	125	1.56
99	43	21	485.63	33	64	1.44
100	22	11	518.53	17	31	1.33
101	11	6	553.68	8	14	1.23
102	5	3	591.16	4	6	1.13
103	2	1	631.06	2	2	1.03
104	1	1	673.49	..	..	.94

many problems in population study must be answered.* Incidentally, it should be remarked that life tables, as generally constructed, represent a fixed mortality of a particular calendar year or period. Such a table tells us what *would* be the number of survivors to age 10, 20, etc., *if the mortality at each age remained constant as of the calendar year or period for which it is constructed.*

APPLICATIONS OF THE LIFE TABLE

It is significant that two seemingly opposed designations have been applied to the same thing; "Mortality Table" or the "Life Table." Quite in accord with this dual character of the life table, its applications may be broadly classed in two categories—applications relating primarily to mortality and death rates, and applications relating primarily to survivals. In the field of life insurance we find a corresponding duality of interests related to these two aspects of the life table: insurance for the benefit of others in the event of death of the insured; and insurance in the form of endowments or annuities for the benefit of the insured himself in the case of his survival.

Application to problems of mortality —On this occasion we are concerned with applications to general demographic problems. In the first category, applications relating more particularly to mortality, we have, first of all, the direct use of the life table as a gauge or measure of the mortality in a given population or group of persons. The crude death rate, for well known reasons, is not a good measure, because it is quite seriously affected by differences in age composition. Standardized death rates, on the other hand, have the disadvantage that they depend on an arbitrarily selected standard population. The life table is free from this arbitrary feature, and, of course, with its several columns, exhibiting, for a "cohort" or "generation" traced from birth through life, the number of survivors, the number of deaths, the death rate, and the expectation of life at each age, such a table gives much more detailed information than a general death rate, whether crude or standardized.

There is, however, necessarily a relation between the picture presented by the life table and the corresponding general death rate. This is exhibited in Figure I in which there have been plotted, as abscissae, the values of the standardized death rates for white males in each of the states of the Union as of 1929–1931, against the corresponding values of the expectation of life at birth, as ordinates. It will be seen that the scatter of points thus shown clusters very closely about a straight line. In point of fact, the coefficient of correlation is almost unity, its exact value being $r = -.992 \pm .002$. This suggests that the expectation of life could be gauged *approximately* for any one of these states, if the standardized death rate and the regression equation were given. This equation in the present example takes the form

$$e_o = 78.337 - .0174\,d$$

where d is the standardized death rate per 100,000. In Table II the values of the expectation of life thus computed for each state from the regression equation is shown, together with the difference between the value thus computed and that obtained by the more accurate process of computing the life table. It will be seen that in all but two instances the error is less than one year, and in all but seven it is less than one half year. Incidentally, it is of in-

* The details of the computation of a life table are rather highly technical. For a detailed description of two alternative methods that have been employed for this purpose the reader may be referred to *Length of Life—A Study of the Life Table*, by Louis I. Dublin and Alfred J. Lotka, Ronald Press, 1936, p. 307, Chapter XIV.

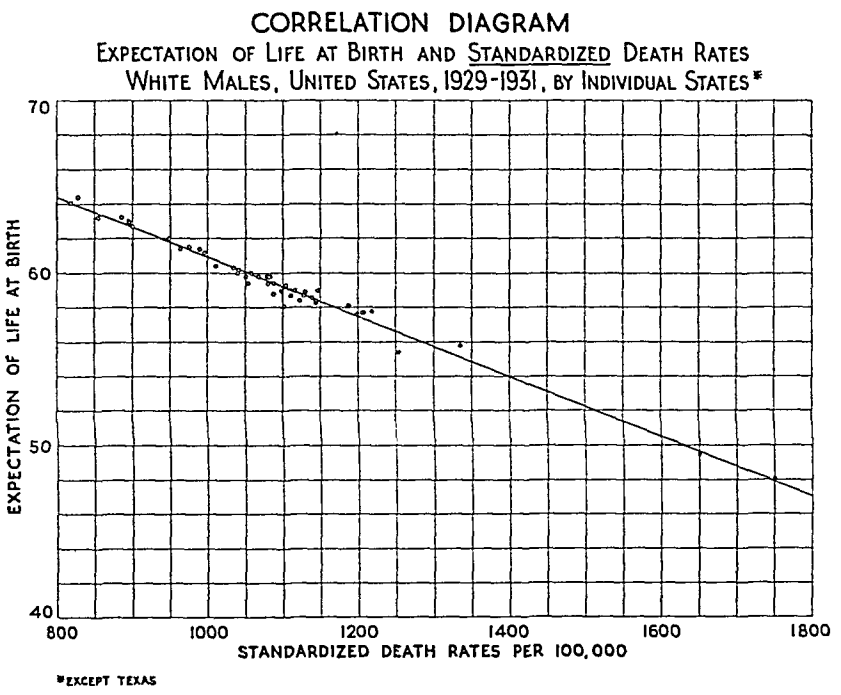
TABLE II

Expectation of Life at Birth and Standardized Death Rates per 100,000 for Each State of the United States, Except Texas, 1929–1931—White Males‡ All Ages*

State	Expectation of Life at Birth $\mathring{e}_0$	Standardized Death Rate	$\mathring{e}_0$ Computed from Stand. D.R. by Regression Equation $\mathring{e}_0$	Col. (4)–Col. (2)
(1)	(2)	(3)	(4)	(5)
South Dakota †	64.38	828.0	63.95	—.43
Kansas	63.24	885.8	62.94	—.30
North Dakota	63.24	855.1	63.47	+.23
Iowa	63.04	896.3	62.76	—.28
Nebraska	62.92	895.5	62.77	—.15
Oklahoma	62.72	900.3	62.69	—.03
Minnesota	61.97	947.9	61.86	—.11
Wisconsin	61.51	975.5	61.38	—.13
Idaho	61.44	962.5	61.61	+.17
Washington	61.37	990.2	61.13	—.24
Oregon	61.17	995.5	61.03	—.14
Arkansas	60.43	1,013.2	60.73	+.30
Mississippi	60.34	1,035.1	60.35	+.01
New Hampshire	60.24	1,042.0	60 23	—.01
Indiana	60.04	1,057.9	59.95	—.09
Vermont	59.97	1,040.7	60.25	+.28
Michigan	59.80	1,083.3	59.51	—.29
Ohio	59.78	1,079.5	59.57	—.21
Wyoming	59.78	1,050.7	60.08	+.30
Connecticut	59.77	1,081.8	59.53	—.24
Missouri	59.76	1,068.4	59.77	+.01
Montana	59.40	1,080.7	59.55	+.15
Alabama	59.37	1,088.4	59.42	+.05
Kentucky	59.37	1,054.1	60.02	+.65
United States §	59.31	1,103.7		
Massachusetts	59.29	1,104.5	59.14	—.15
Illinois	59.02	1,115.9	58.94	—.08
Florida	58.99	1,098.1	59.25	+.26
New Jersey	58.96	1,146.7	58.41	—.55
North Carolina	58.95	1,116.5	58.93	—.02
Georgia	58.92	1,130.6	58.69	—.23
Tennessee	58.76	1,087.7	59.43	+.67
Maine	58.70	1,112.3	59.00	+.30
Virginia	58.69	1,128.6	58.72	+.03
California	58.56	1,139.6	58.53	—.03
Louisiana	58.42	1,145.4	58.43	+.01
Utah	58.42	1,124.2	58.80	+.38
Delaware	58.25	1,145.1	58.43	+.18
West Virginia	58.14	1,102.4	59.18	+1.04
Rhode Island	58.06	1,187.9	57.69	—.37
New York	57.84	1,219.5	57.14	—.70
Maryland	57.72	1,206.2	57.37	—.35
Pennsylvania	57.68	1,207.1	57.36	—.32
South Carolina	57.64	1,198.2	57.51	—.13
Nevada	55.77	1,334.8	55.14	—.63
Colorado	55.40	1,254.4	56.54	+1.14
New Mexico	49.46	1,650.5	49.65	+.19
Arizona	48.08	1,750.4	47.91	—.17

* Standardized on the basis of "Standard Million" of England and Wales, 1901.
‡ White Males include Mexicans
† Based on deaths for 1930 only.
§ Exclusive of Texas and South Dakota.

FIGURE I



terest to compute the correlation coefficient using the crude death rates. The correlation in that case is considerably less close, namely $r = -.752 \pm .063$. Figure II illustrates the much wider scatter of the values of the crude death rate and the expectation of life at birth. The correcting effect of standardizing the death rate shows itself in these results.

Historical study of past longevity— The expectation of life at birth, which we thus recognize as a more efficient measure for purposes of comparison than the simple death rate, gives us an interesting index by which to establish a historical survey of longevity at different periods.

Naturally, data for the remote past are scant and unreliable. Estimates based on tombstone inscriptions in ancient times, indicate that in certain Roman provinces of Africa, the expectation of life at birth may have been about 35 years. In the city of Rome itself, possibly conditions were less favorable, and we may broadly surmise that the expectation of life at birth there was somewhere between 20 and 30 years.

For the long stretch of years from the time of the Roman Empire to the latter part of the 17th century, we have not the basis for even the roughest of estimates. About the end of the 17th century, judging by a somewhat crude table prepared by Halley on the basis of mortality in the German city of Breslau, the expectation of life at birth was about 33½ years. From the early 18th century on, life table construction became more systematic, and indications are that, at the beginning and up to about the middle of the 19th century, an average length of life of 35 or 40 years may have been common in various localities among civilized people. By the beginning of the present century, the figure had risen to about 49 years. Thus there was a gain of about 9 years in the second half of the 19th century,

far outstripping, in proportion, the gain of about 7 years in the preceding 150 years. Since 1900, the improvement has been even faster. At the time of the last census, 1930, our expectation of life at birth here in the United States was just about 60 years, and according to our life table for the year 1933 we had definitely reached 61 years. But we still have 5 more years to gain in expectation of life at birth before we equal the world record which today is held by New Zealand, namely 66 years.

The life table gives the expectation of life not only at birth, but at each year of life, and the question arises how persons of different ages have shared in the gain in expectation of life. Without going into detail, we may recall the familiar fact that the greatest reductions in mortality have taken place in infancy, so that the gain in expectation of life is greatest at birth. However, there are gains in childhood and adolescence and maturity, although one of the facts which we have to record with regret, is that, from midlife on, gains have in recent years been but slight, and in some recent decades the expectation of life at these ages has actually suffered a setback. This is shown, for example, in the case of white males, in the accompanying graph, Figure III.

Curtailment of life due to individual causes of death—The life table is capable of more refined applications than its gross use in connection with the general mortality from all causes combined. As ordinarily constructed, the table makes no distinction of deaths according to cause. But it is a relatively simple matter so to modify the computation, as to obtain a life table representing, for example, the mortality such as it would be if some one cause of death, or a group of such causes, were eliminated, assuming, however,

FIGURE II

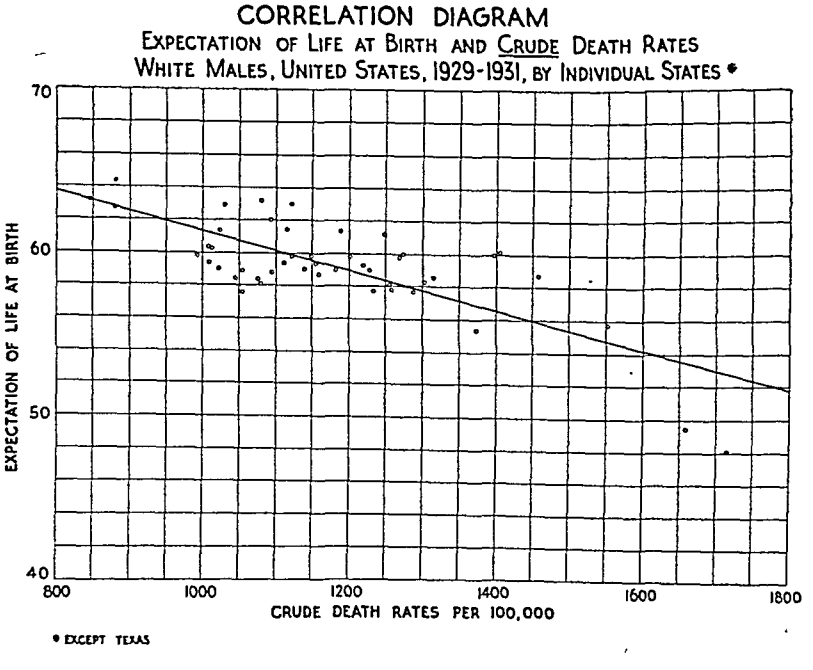
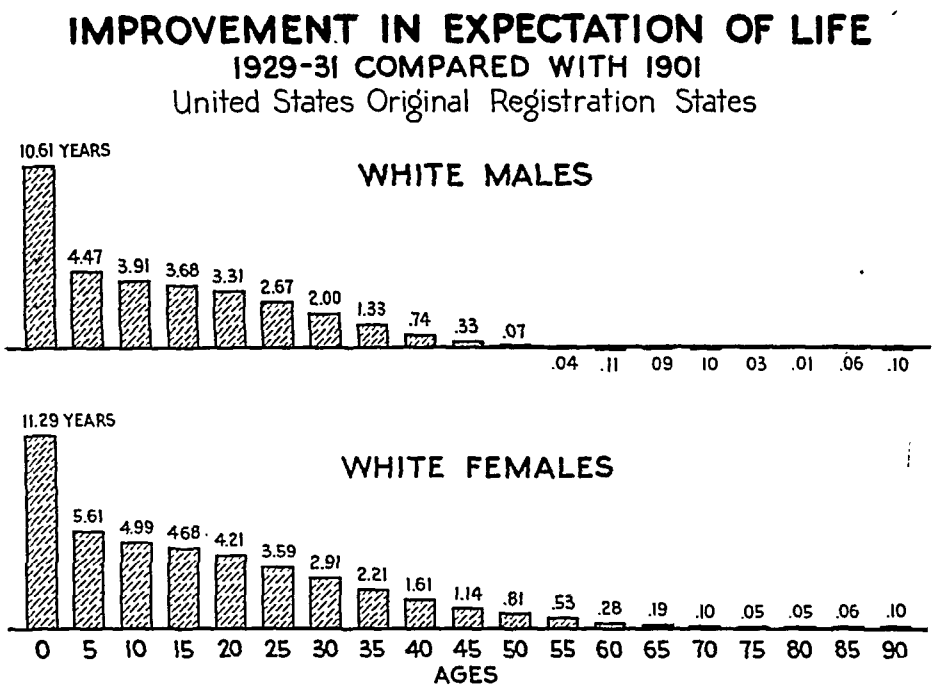


FIGURE III



that the persons thus preserved from death by the particular causes eliminated, were subject to and ultimately succumbed to the mortality from the remaining causes. This computation has been carried out for 8 of the principal causes of death, namely diseases of the heart; cancer, all forms; tuberculosis, all forms; chronic nephritis; cerebral hemorrhage; diabetes; angina pectoris; accidental and unspecified violence. The results of these computations are shown in Table III. The table is so arranged as to show the years of life that would be gained if the specified cause of death could be completely eliminated. So it is seen that the expectation of life at birth would be increased by nearly 2½ years if heart disease could be eliminated. Accidents and unspecified violence also represent a large item in the case of males, accounting for 2 years of life. In the case of females, this is a less serious item, namely 0.80 year. Another large item is cancer, especially in the case of females, 1.79 years. In surveying these figures, it must be borne in mind that, other things equal, a cause of death which operates early in life, or through the whole range of life, naturally produces a greater loss of years than a cause which operates later in life.

An interesting point brought out by Table III, is that the effect of eliminating two or more causes of death together is cumulative. Thus, in column 10 is shown the sum of the individual years of life, that would be gained by eliminating each of 8 causes *separately*. Column 11, on the other hand, shows the number of years of life that would be gained if all these 8 causes were eliminated *simultaneously*. It will be seen that the effect of jointly eliminating these 8 causes ranges from 52 to 81 per cent, according to the age and sex considered, in excess of the sum of the separate effects for each cause. This is a fortunate situation, for it means that our combined efforts to reduce the mortality from various causes result in

TABLE III

Years of Life That Would be Gained by the Elimination, Singly and Jointly, of 8 Causes of Death—White Males and White Females, United States Registration States of 1920 in 1930

	Years Gained by the Elimination of Single Cause										
Sex and Age	*Diseases of Heart*	*Cancer, All Forms*	*Tuber-culosis, All Forms*	*Chronic Nephritis*	*Cerebral Hemor-rhage*	*Diabetes Mellitus*	*Angina Pectoris*	*Accidental and Un-specified Violence*	*Sum of Individual Effects of Each Cause of Death*	*Cumu-lative Effect of 8 Causes Combined*	*Per Cent Excess of Col. (11) Over Col. (10)*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Males											
0	2.41	1.12	1.10	.97	0.81	0.19	0.27	2.05	8.92	13.57	52.13
12	2.61	1.22	1.11	1.07	0.90	0.21	0.30	1.84	9.26	14.17	53.02
22	2.60	1.23	1.01	1.07	0.92	0.20	0.31	1.48	8.82	13.69	55.22
32	2.62	1.24	0.76	1.07	0.95	0.19	0.31	1.08	8.22	13.01	58.27
42	2.62	1.22	0.51	1.05	0.97	0.18	0.31	0.79	7.65	12.38	61.83
52	2.52	1.12	0.29	1.01	0.96	0.17	0.27	0.53	6.87	11 44	66.52
62	2.26	0.88	0.15	0.91	0.89	0.14	0.21	0.34	5.78	9.89	71.11
72	1.84	0.53	0.06	0.74	0.70	0.08	0.12	0.21	4.28	7.52	75.70
82	1.27	0.23	0.02	0.48	0.42	0.03	0.05	0.15	2.65	4.58	72.83
Females											
0	2.58	1.79	1.09	1.10	1.04	0.37	0.14	0.80	8.91	13.74	54.21
12	2.73	1.90	1.06	1.17	1.11	0.38	0.15	0.58	9.08	14.25	56.94
22	2.70	1.93	0.85	1.16	1.13	0.37	0.15	0.49	8.78	13.95	58.88
32	2.70	1.94	0.51	1.16	1.16	0.37	0.16	0.43	8.43	13.55	60.74
42	2.69	1.82	0.32	1.13	1.18	0.38	0.16	0.39	8.07	13.13	62.70
52	2.58	1.49	0.19	1.03	1.13	0.35	0.15	0.34	7.26	12.22	68.32
62	2.38	1.04	0.12	0.90	1.03	0.26	0.14	0.31	6.18	10.65	72.33
72	1.98	0.59	0.06	0.69	0.82	0.12	0.09	0.28	4.63	8.26	78.40
82	1.38	0.25	0.01	0.42	0.51	0.03	0.04	0.24	2.88	5.21	80.90

more than merely the summation of the individual effects that would arise from the elimination of each of such causes separately. In other words, our gains in this field of work are cumulative. The reason for this is that if, for example, tuberculosis is eliminated at the same time as heart disease, not only those persons would be restored to life who ordinarily would have died from tuberculosis, but also a further number, namely those who, having been saved from heart disease, would subsequently have succumbed to tuberculosis if heart disease alone had been eliminated; and a similar statement holds with regard to those who, having been saved from tuberculosis would subsequently have died from heart disease, if tuberculosis alone had been eliminated.

Application of the life table to problems of survival—In the second category, applications of the life table to problems related more directly to survival, are such problems of great practical importance as the forecasting of the future population, and the making of estimates of the population classified by sex and age during post-censal current years.

Both these problems require for their solution the construction of a population, classified by age, at some subsequent time, as the survivors, at that time, of two groups of persons, namely first, those living at a given earlier period, and second, those that are born in the interim. The number of these survivors is determined by means of a life table, or a succession of life tables, applicable to the period of time considered. The number of births, so far as forecasts are concerned, can only be estimated on some reasonable hypothesis. In the case of estimates of post-censal current population, we stand on

more secure ground in this respect, since we have available statistics of births registered in the years elapsed since the last census.

Application of life table to measure the capacity for growth of a population —An application which has very important bearings on population policy is the computation of the true rate of natural increase, that is, the measure of the excess of fertility over mortality, such as it appears when the influence of temporary features of the age distribution is eliminated. As is by this time well known from our previous publications * the mere excess of the birth rate over the death rate does not give a true measure of this feature. Our low death rate of about 11 per 1,000 gives us a very incorrect idea of the intrinsic mortality in our population. This is evident from the mere fact that in the long run a death rate of 10 per 1,000, after the population had become stationary, would correspond to a mean length of life of 91 years. We all know perfectly well that the average length of life among us today attains no such figure as this. It is only a little over 60 years.

Similarly, our birth rate figure is deceptive. Low as it is, 17.1 per 1,000 (1934), it is still bolstered up by the influence of past high birth rates in giving us a higher proportion of persons within the reproductive ages today than we should have on the basis of our current fertility. If proper allowance is made for this feature, we find for the latest date available a true birth rate of 15.2 per 1,000, a true death rate of 15.8 per 1,000, and, as is now a familiar fact, we find ourselves definitely in the red as regards the balance of fertility over mortality, with a negative true rate of natural increase, namely —.6 per 1,000. The curve of the birth rate, which formerly was above that for the death rate, crossed the latter about 1930 or very soon after.

* To these the reader must be referred for details of method of computation. He will find them described in the *Journal of the American Statistical Association*, 1925, pp. 305–339; also, though with less detail in *Length of Life*, by Louis I. Dublin and Alfred J. Lotka, Ronald Press, 1936, pp. 244 *et seq.*

CONCLUSION

Only a few applications of the life table to problems in vital statistics have been presented by way of example. The list might be extended to include such topics as the probability of dying from specified causes; the age distribution of deaths from specified causes in a generation of persons traced from birth to the extinction of the entire generation; the proportion of widows and of orphans in the population, and the related problem recently discussed by P. Luzzatto-Fegiz in his article The Occupational Evolution of a Generation *; or, to mention one more example, the extinction of a line of descent—a problem which is of interest not only in human vital statistics but also in relation to certain problems in genetics.†

The fact is that possibilities of such applications are legion. It has not been the purpose of this brief paper to attempt even a summary of this subject, but only by a few landmarks here and there to give some idea of the scope and nature of the field. It is the less necessary to attempt here an exhaustive presentation, as we have recently published a volume of some 400 pages dealing, in some detail, with these matters, under the title "Length of Life—A Study of the Life Table." To this volume we must, therefore, refer for further details.

* *Population, J. International Union for the Scientific Investigation of Population Problems*, 1935, Vol. 2, p. 37.

† Lotka, A. J. The Extinction of Families. *J. Washington Academy of Sciences*, 1931, Vol. 21, pp. 377, 453.

Tests and Promotion of Registration of Births and Deaths*

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ETERNAL vigilance is the price of registration.

I may say at once that I do not believe that any state registration office nor any large city office in the United States secures and maintains 100 per cent registration.

There are many reasons for this. In the matter of births, we have to deal with carelessness of the physicians or midwives, and ignorance on the part of other attendants, together with the possible miscarriage of the mails (a rather remote possibility) and a possible slip in the registration machinery, either local or state, a possibility not so remote.

In the matter of deaths, the carelessness of the undertaker is largely responsible, but the laxity of the local registrar is a frequent cause of non-registration when he issues a burial permit on the promise of the undertaker to furnish the certificate later. If the local registrar insists on receiving a complete certificate before issuance of a permit there will be little trouble in this regard. But here also is a possibility of a slip in the registration machinery. Through all registration runs the thread of human error.

Recognizing these factors, it is necessary that a definite and comprehensive plan of checking be developed in all state and local offices and upon these plans rests the success or failure of registration.

It is the purpose of this paper to discuss some of these plans and methods of checking as they have come to our knowledge, and to evaluate them.

In a group of state registrars, I asked the question, "What would happen to registration if the state office would 'lay down' on the job and simply accept the records sent in and make no effort to stimulate or check registration?" The consensus of opinion of these experienced men was that registration would fall to 50 per cent or less in 5 years, and yet I believe that is the attitude of more than one state office.

With the establishment of the U. S. Registration Area, it became necessary for the Bureau of the Census to check those states which had applied, to determine whether their registration met the minimum requirement of 90 per cent which had been set for admission.

The general method of checking was to obtain lists of births or deaths from postmasters, ministers, and other persons not directly concerned with registration matters and then send an agent

* Read at a Joint Session of the State Registration Executives and the Vital Statistics Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 22, 1936.

of the Bureau of the Census to check these lists against the state records.

Perhaps the working of this method may best be described by reciting my own experience in a check made for deaths. In the period covered, between 6,000 and 7,000 deaths had been registered and the agent of the Bureau of the Census presented himself with a list of some 4,000 names—about 60 per cent. Most of the names checked against the city or county from which the report came. Others were located through the state-wide index, the deaths having occurred elsewhere than in the district from which reported. If a death record was not found, it was immediately taken up with the local registrar, with the frequent result that the death was found to have occurred outside of the state. The final result was that 16 deaths (0.4 per cent) were not registered. The value of such lists, however, is doubtful.

I recall one list which checked out perfectly. The names appeared in the exact order in which the certificates were numbered and upon inquiry I found that it had been compiled from the local registrar's record.

A later plan has been to secure lists through the distribution of cards directly to families by postmasters and rural carriers, with the consent and coöperation of the Post Office Department—these cards to be filled out and sent under frank to the Bureau of the Census and then checked with the state records.

It is probable that some type of post-card check is a desirable method of securing information as to births and deaths. The type of card and method pursued are open to question. The distribution of cards and the persons from whom the information may be obtained must of necessity vary with the community to be surveyed.

Under any circumstances there will be many errors in the lists submitted—the births or deaths did not occur in the district from which reported and possibly not within the state, and in checking returns from any type of list or card it is immensely important that a state-wide index be used as the detail of the place or date of the event will often be overlooked or omitted by the informant. No birth or death should be regarded as unreported until it is checked with the local registrar, which will often bring out essential facts such as the misspelling of the name, the date, or the place of the event.

One very definite weakness in our registration machinery is found in the lack of coöperation between the states in supplying information as to out-of-state resident births and deaths. This information is valuable and would aid in the checking of registration and broaden the opportunity for service. As an illustration: An attorney came to our office a short time ago and wanted a death certificate. It was not found to be filed at the place where he said the death occurred. He was very positive that the person had died in his city, but upon further examination of the records it was found that the death occurred at a hospital in Baltimore. I am informed by the Bureau of the Census that not all states are coöperating by sending them copies of their non-resident births and deaths for distribution. I think a more comprehensive plan must be developed for this work.

The use of inexperienced help in any type of check is of doubtful value.

A recent survey made in Georgia was projected on a basis of 3 principal points:

a. The convenient test card survey of the completeness of registration.
b. A survey by enumerators, whose purposes were:
 1. To obtain data in greater detail than was practical by the test card methods

2. To indicate the representativeness of the birth sample obtained by methods of the test card

c. A publicity campaign to emphasize the importance of birth registration in general and to stimulate the prompt return of the test card

A criticism we have to offer of the general plan is directed first to Item (b) the survey by enumerators. If the purpose of this survey was to secure information for other use it might excuse the schedule which enumerators were expected to fill out, but for the purpose of checking the completeness of registration it seems to me so elaborate that it would cloud the whole purpose. I do not think that this effort was worth the time and money it must have cost.

The use of a publicity campaign at the time of making a check is, I think, a mistake. We are not materially concerned with a check except as it will show us the general completeness of registration. A wide publicity campaign will undoubtedly result in physicians following up old records and getting them in, and stimulate a certain amount of reporting at that particular time, which would not be representative of the general conditions. I do not mean to indicate that I consider a publicity campaign of no value. The more we can educate the people as to the value of records, the more nearly complete will be our registration, but the publicity campaign should not be conducted at a time when we are checking for completeness because what we wish to determine is the everyday registration—not the completeness that is stimulated by publicity.

There are many kinds of checks used in different offices and these must vary with the community. We propose to discuss some of the methods in use and are indebted to the Bureau of the Census for information on this matter.

Probably the most common birth check is that of the deaths of infants under 1 year of age to see if a birth certificate has been filed, provided the death certificate shows that the birth occurred in the state. This is routine practice in 38 states. The check should be made in each local and state office promptly. Unless done every month it becomes a tedious job, and the longer the delay in getting after an unreported birth the less chance there is of getting it.

The checking of newspaper lists of births and deaths is of little or no value. The newspapers usually secure their information from the local registrar and the list only includes those births and deaths that have been registered. Such publications have great value otherwise and should be stimulated, as parents naturally look for the publication of the birth in their family and if they do not find it within a reasonable time are apt to investigate and secure the registration.

The routine checking of hospitals for both births and deaths should be done by the local registrar in every district in which a hospital is located. In some of the states it is required that hospital lists be sent routinely to the state offices and this seems good practice. Many physicians attending a birth at a hospital depend upon the hospital to report it. This is bad practice as the hospital has no responsibility in this regard. In our state we have succeeded in arranging with many of the hospitals to prepare a birth certificate as soon as the prospective mother enters the hospital, complete except the date of birth, sex, and name of the child, which can be readily filled in after birth, so the certificate is ready for the physician's signature and delivery to the local registrar. In hospitals which follow this practice the results have been very satisfactory.

The certificate is usually typed and much more easily read than the writing of some physicians. The practice of checking hospital lists is followed in 20 states.

The local registrar can often secure baptismal records from the churches located in his jurisdiction and where this can be arranged it is a valuable check.

In many of our cities the schools require a birth certificate at the time the child first enters school. This practice is not universal, but should be, as it would mean an application for a birth certificate at an early age, and if the birth has not been recorded it can usually be secured from the attending physician who is likely to be available, whereas, if deferred until later life it is much more difficult. Some of the states use the periodical school census as a check of registration, and where available it is good practice, but it would be much more effective if a birth certificate was required as a condition for first entrance into school.

The records of child hygiene clinics are a valuable source of information in checking registration, used in 12 states.

In 15 states the maternal deaths are followed through for birth registration. These are valuable records as far as they go but there are many maternal deaths in which there is no issue such as deaths due to abortion or miscarriage.

Another valuable source of information which should not be overlooked is a check of all cases of communicable disease reported in young children for birth registration. This plan is followed in only 5 states and could well be extended.

In checking deaths many of the states require reports of all coffin or casket sales. In some states casket dealers are required to file a monthly report and deaths are checked against these records. In many rural places it is a common practice for the neighbors to assist the family in the disposal of the body, and a coffin or casket may be purchased from some dealer but no regular undertaker is employed. This type of check is routine in 19 of the states.

The checking of sextons' records, of questionable value, is employed in 5 states. If a burial permit were always required the necessity for this would be obviated as no sexton should permit an interment in a cemetery under his charge without the filing of a burial permit.

This brief discussion of the various methods of checking used in several states is given simply as an outline but none will be of any value unless faithfully and promptly followed through. If the various practices of checking are used simply as a " filler " job to be done when there is no other work they are of very little value.

Many states do not employ a regular field agent but there must be someone available in every state office to take the field when necessary in order to straighten out the many problems which arise. Among a large number of registrars there are bound to be some that are pretty poor and they must be visited occasionally and straightened out. In Michigan it is the practice to send the State Police after local registrars who are delinquent in sending reports. This is effective, the State Police " get their man." A field agent must be fully posted on all phases of the law and be prepared to follow cases through court if necessary.

One of the most potent factors in birth registration is the sending of a birth notification certificate to the parents. The Bureau of the Census has recently developed a new certificate, very pretty to look at, which may be mailed under frank. We do not use this type of certificate in our state because the registration of births is a

state function and the name of the state does not appear on the Census certificate. This is a mistake. We should be able to send these certificates under frank in coöperation with the Bureau of the Census and to send a certificate bearing the name of the state. The certificate should be in attractive form so that it will be prized by the parents. When the mother does not secure a certificate for her baby and her neighbor does, she is immediately concerned about it.

In our state a great many of the certificates are delivered by the nurses. This has the advantage of giving the nurse entry into the home, which might otherwise be difficult, and which helps in correcting errors which may appear in the certificate such as the spelling of the family name, or the name of the child. The capable nurse notes this information, which notation should be signed by the parents, and returns it to the state office for correction, which makes for more perfect records.

Another thing is that it frequently serves as a check on unreported births. When the mother receives a birth certificate for a recent birth, she recalls that she did not receive one for the child born 2 or 3 years before. The smart nurse will get this information and aid in securing a registration of this birth.

When the state office has information of an unreported birth or death, it should never let up until the registration is made, and it is through such channels as those mentioned that such information is secured. If this procedure is faithfully followed, but few births and deaths will escape eventual registration.

The question is often asked, "Do you prosecute a physician for failure to report births?" So far as my own state is concerned, "we do." The reporting of births by the attending physician is a duty which he owes to his patient, to the state, to his profession, and to the law. He should not be permitted to escape this duty. I do not mean to imply that every case not reported within the 5 days required in the law is prosecuted. When we hear of an unreported birth, a letter is sent to the physician asking that he make an immediate filing of the record. If the birth is not included with the local registrar's next report, a follow-up letter is written, and if this is not successful the matter is taken up with the district councillor of the State Medical Society for his district. He usually writes or meets the physician, and in more than 90 per cent of the cases will secure the filing of the certificate.

We have been successful in securing the coöperation of the State Medical Society and the district councillors have been very helpful in aiding the department in securing registration. This is a point that should not be overlooked in any state. The Medical Society naturally does not wish to see its members prosecuted for violations of the law and is frequently willing to go a long way to help in the matter of reporting.

If these efforts are not successful, the matter is then turned over to the enforcement officer for the department, with the result—prosecution.

Within the last few years, one physician who had been a constant violator of the law lost his case in the Circuit Court and appealed it to the Supreme Court, with the result that we had a splendid decision from the Supreme Court absolutely settling for all time the question of responsibility of the physician for reporting births. The court ruled that the state has a right under its police powers to demand these records.

The physician is protected in his practice, and in appreciation of that

protection should certainly comply with the law requiring registration of births.

So far as the undertakers are concerned, we rarely go into court with a case but take it up with the board having to do with the licensing of embalmers, and if necessary secure the revocation of the license. This is more effective than taking the matter into court where an offender would be assessed, at most, a small fine.

When necessary to make a prosecution, newspaper publicity is given as a warning to other careless physicians.

I do not wish to indicate that I think the survey made in Georgia and in other places was without value. Any publicity and checking will result in better education of the people as to the value of registration and undoubtedly tends to improve it, but it is of no great value as a test of the completeness of registration.

Some plan should be developed by the Bureau of the Census and by the states that would give a more or less continuous check on registration. The checking of states occasionally is of little value. In our state there has been no check of registration by the Bureau of the Census since 1921. Such check should be carried on continuously. Every state official knows or should know the weak districts in his state. There are always a few physicians that are continuously delinquent or careless in filing their reports.

The plan I would like to see put into operation in our state—and will apply equally well in other states—is to select certain districts every month or every few months, have the Bureau of the Census secure such lists as they can from those districts and send them to the state office to be checked and followed up. If we could follow such a plan, picking the counties or districts where we felt the completeness of registration was doubtful, we would soon educate the physicians in those areas to be more prompt and accurate in filing their records. I know that the psychological effect is good when we are able to walk into a physician's office and say: "You have not reported the birth of so-and-so." He may wonder how you got your information but the fact that you did have it will cause him concern and make him more careful. It is one thing to visit a physician and talk to him in a general way about the reporting of births, and quite another when you have definite information. Your approach is entirely different and no excuse or general statement will evade the fact that he has been delinquent.

I appreciate the attitude of the Bureau of the Census that no check which is not made under their personal representative is of any value, but I think they are wrong. The state registrar who knows his job is just as anxious to get the facts as the Bureau of the Census could possibly be, and he may be trusted to report the facts. There should be closer contact between the Bureau of the Census and the state registrar, for the Bureau of the Census is entirely dependent upon state registrars for such records as they have. Their statistics cannot be any better than the state registrars make them.

The plan of regional meetings of state registrars started about 2 years ago was one of the best moves made by the Bureau of the Census, and the plan should be continued and enlarged. It is hoped that the Director of the Census will put into his budget a sufficient amount to cover not only regional meetings but at least one general meeting a year, to include all state registration executives.

The proposed plan of the Bureau of the Census to divide the country into districts and to have a representative of the Bureau of the Census resident

therein, with supervision over the states in his district will be of value only if the person thus assigned is trained in state registration. This training cannot be secured in the Bureau of the Census or anywhere except in a state office. This is equally true of the plan which has been discussed of having a representative of the Bureau of the Census in each state office

A few years ago the issuance of certified copies of records was a very minor detail of office routine, but has now become a major activity in states having old records, due to the old age pension and insurance demands. In states where the records are relatively new this is probably not so much of a problem. In Michigan the records date back to 1867.

To do effective work, a state registrar should have a public health background in order that he may understand the best use of his records in aiding the department of health in building its program. He must also understand their legal value and be prepared to meet it intelligently.

The value of these records increases enormously as they approach complete registration, and every effort should be made to reach this end. Constant checking and careful attention must be routine in every state office.

Eternal vigilance is the price of registration.

Scholarship in Training for Post in Tuberculosis Field

IN accordance with action taken by the members of the National Conference of Tuberculosis Secretaries at the New Orleans annual meeting on April 22, 1936, a full tuition scholarship of $300 is being made available for the academic year September, 1937, to June, 1938. After careful canvass, the Department of Public Health of the Yale University School of Medicine, New Haven, Conn., has been selected.

Applicants must have a Bachelors Degree for a 4 years' undergraduate course in a college, university, or technical school of approved standing. Preference will be given to those who have had courses in bacteriology, chemistry, physiology, psychology, economics, and sociology and to those who have had practical experience in a tuberculosis organization. The nature and quality of the collegiate work of the applicant and personality qualifications will also be considered.

The scholarship is available to those now engaged in tuberculosis work as well as to others, including those who expect to graduate from college in June.

Application blanks may be secured from Professor Ira V. Hiscock, Department of Public Health, Yale University School of Medicine, 310 Cedar Street, New Haven, Connecticut. The scholarship will be awarded on or about June 21, 1937, and applications should be made *not later than May 28.*

The Use of Lay Boards by Official Health Agencies*

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PUBLIC health nurses have been employed by health departments in cities of the first class in Minnesota since 1909. However, not until 1919 did the Minnesota Legislature authorize the expenditure of public funds for public health nursing services throughout the state. As a nurse working alone seemed distinctly out of place in a county and as there was no county-wide health organization under which the nurse employed by county commissioners might work, the same law provided that she should be directed by the county health officer, the county superintendent of schools, or the county child welfare board. The county health officer in Minnesota was usually a non-salaried person with jurisdiction only over non-organized territory. The superintendent of schools, while interested in the health of school children, was hardly in a position to direct a health program. The county child welfare board consisted of 5 lay people authorized by law to promote the enforcement of laws for the protection of defective, illegitimate, dependent, neglected, and delinquent children. Because of the impracticability of developing a well balanced public health program under this arrangement the law was amended in 1925 as follows:

Section 6. Chapter 196—S.F. 495—The board of county commissioners of any county may detail county public health nurses to act under the direction of the County Board of Health or a nursing committee composed of at least 5 members as follows:

The County Superintendent of Schools

The County Health Officer or a physician appointed by the county commissioners

A county commissioner appointed by the county commissioners

Two residents of the county appointed by the county commissioners

Section 7. The nursing committee of each county shall effect a permanent organization, and meet at regular intervals with the nurse or nurses.

In order to coördinate the work of the various local organizations interested in some phase of health work and with whom the nurse desires to coöperate, it has often been necessary to enlarge this committee of 5. In many counties it has formed the nucleus for a much more representative group.

These public health nursing advisory committees, as they are called, have been found to be wonderful stabilizers, not only in maintaining a continuous public health nursing service but also in developing sound public health programs based on community needs. They have no authority but merely act in an

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advisory capacity to the board employing the nurse. As this board has approved their appointment, recommendations made by the committee are usually accepted. They serve without compensation or even reimbursement for necessary expenses to attend committee meetings which are usually held once a month. In general their functions may be said to be threefold.

First, administrative—Raising the annual budget is an important function of the committee, as in many instances the county appropriation must be supplemented. This is usually accomplished by pooling the resources of the various agencies interested in the work throughout the county. The committee also selects the public health nurse and recommends her appointment by the Board of County Commissioners. Credentials of available candidates who are eligible for state certification supplied by the State Department of Health are studied. Usually one or more candidates are interviewed by the committee, or some member delegated by them, before a selection is made. The need for qualified workers is quickly sensed by the group and the state tries to refer only those applicants who meet particular local requirements.

The second function of the local nursing advisory committee is that of planning the program with the nurse and setting up the policies which shall govern the service. More and more we find the committees setting up a sound, long range program based on the needs of the community, taking into consideration the available resources. The summaries of public health nursing reports sent out annually by the State Department of Health are carefully studied as to state-wide trends. The *Rural Appraisal Form* of the American Public Health Association, in its application to local needs, is often used as a guide in evaluating the service.

The need for a clear understanding and close coöperation with the local medical and dental professions is appreciated by these committees, and the practising physicians and dentists. In many counties, in addition to having one or more doctors on the nursing advisory committee, a medical advisory committee has been appointed by the County Medical Society which is composed usually of 3 physicians who help set up policies governing the service and standing orders for the nurse. Modified to meet local needs, these are usually based on the standing orders and policies drawn up and approved by the State Medical Association. This local medical advisory committee also has referred to it problems regarding policies which may arise from time to time, *e.g.*, whether or not a clinician will be brought into the community from outside, whether or not school children will be examined in school or in the physician's office, procedures for carrying out immunization and vaccination programs, etc.

The third function of the committee is to interpret the service to the community and guide the nurse in developing that service. This, of course, does not mean that a lay committee advises regarding nursing technic, rather, they help decide how to make most effective for their community a program in conformity with well established practices in the field of public health.

In addition to the central administrative committee, about 4 auxiliary or sub-committees are usually organized throughout the county which bring more closely together the needs of local communities and the service available to them. They also help to interpret and augment the services of the nurse. The committees are encouraged to report the work they do to the Central Committee which in turn sends it to the State Department of Health.

Examples of their activities are:

1. Report prenatal, infant, communicable disease and other cases needing attention
2. Organize immunization, vaccination, or other clinic programs
3. Establish loan closets, furnish obstetrical packages for home delivery, and layettes
4. Transport patients
5. Organize classes for the nurse to teach
6. Distribute literature, write newspaper articles, and give talks
7. Establish loan funds for corrective work

While advisory committees have been developed in Minnesota chiefly in response to a need in rural areas where a nurse has been the only paid health worker, the plan is also proving very effective where full-time health units are organized. Among the most active auxiliary groups in the state are those found in a county health unit.

In order that the advisory committees may become familiar with the trends in public health nursing policies and practices, and be guided in their local application of them, field nurses from the State Department of Health attend committee meetings as often as possible.

A state manual for committee members to supplement that of the National Organization for Public Health Nursing is compiled and brought up to date each year by the State Department of Health. The members are urged to plan study courses and are also invited to attend the refresher courses planned for public health nurses and committee members.

The advisory committee for school nursing services is usually called "School Health Council." The personnel is appointed by the school superintendents who are more and more appreciating the value of participation on the part of the community. School Health Councils function similarly to the County Nursing Advisory Committees.

With the availability of federal funds for aid to local nursing services, new impetus has been given to Nursing Advisory Committees since one of the requirements made by the State Board of Health is that there must be direction of the program by a local advisory committee with medical and dental representation.

Carrying the idea of working through an advisory committee, the State Board of Health has since 1925 used the recommendations of the State Certification Committee * as a basis for determining the professional qualifications of public health nurses who are referred for positions in the state.

The councillors of the State Medical Association have agreed to act in an advisory capacity to the Board of Health in guiding the development and extension of health work under the Social Security Act.

A state-wide advisory committee on maternal and child hygiene was first appointed by the State Board of Health in 1922. This committee remained active until after the program began functioning smoothly. Recently with the expansion of maternal and child health work through the U. S. Children's Bureau, this committee has been reorganized. As in local communities, the personnel has been carefully selected to represent agencies and individuals especially interested in child health work. As in counties and communities, this state-wide committee we hope will stabilize the service by tying up the interests and directing them toward a common purpose or goal.

We are increasingly impressed with the value of working through and with the type of committees which I have described. Improving health habits and methods become an inherent part of community life for they are acquired —not received—by the community.

* Law Relating to Public Health Nursing, Chapter 196—S.F. 495, Section 4.

In conclusion, I should like to emphasize the following points:

1. The effectiveness of the nurse in the community is measured by her ability to work through an advisory committee. The nurse who is well prepared for her job appreciates the significance of that fact.

2. Public health nursing is a community service and as such requires community participation. The service is of such a nature that it should appeal to the best minds of the community.

3. Professional guidance is indispensable to the stability and effectiveness of the public health nursing service.

4. An opportunity for growth must be provided both for the advisory committee and the nurse through contacts with professional leaders and study groups.

DISCUSSION

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IN her conclusions, Miss Peterson has stressed one point which I feel cannot be over-emphasized, namely, that "professional guidance is indispensable to stability and effectiveness of public health nursing service." This applies not only to nursing service but is a fundamental factor which must always be kept in mind when lay groups participate in any official public health activities.

A cardinal principle in the promotion of public health activities is recognition of the fact that the official health agency is the body which is responsible for public health activities of any community.

The success or failure in the use of lay boards by such agencies will depend very largely on how well the resources and activities of such groups can be coördinated with the official public health program. But, regardless of how well these principles are acknowledged unless a definite objective is recognized, and the coördinate program aimed toward the attainment of that objective, little will be accomplished. When I say objective—it implies that there is a problem to be solved. The public health official must, therefore, determine:

1. What does he wish to accomplish? In other words, what is his objective?

2. What is the problem involved? (I will not rehearse the methods to be employed in this determination.)

3. What is being done to solve the problem?

4. What facilities are now operating?

5. Is the problem being solved or is ground being lost?

6. What resources are available which can be brought to bear in the solution?

7. How can such available resources be coördinated so that greater progress will be shown toward attainment of the objective?

After these questions have been answered, the problem can be approached with a sane program and with hope of success.

Official public health agencies are often lacking in resources and facilities, whether they be funds, personnel, or housing facilities. These deficiencies and shortcomings may frequently be obviated by the use of lay groups who are the possessors of potential resources. On the other hand, suspicion, fear, and jealousy, accompanied by misunderstanding, are the chief retarding factors among lay groups. With a well rounded program, guided by the official health agency, these are reduced to a minimum.

Therefore, coördinate the available resources under the direction of the official health agency, as the body responsible for public health activities in the community. By the application of these basic principles an organization

may be developed whereby the work is not only made easier but much more effective.

The official health agency should keep a list, catalogue, or roster of all organizations on which a call can be made for assistance; as much as possible should be learned about their resources and plans in public health.

The technic of contacting such groups and soliciting their assistance in public health activities is very important. On every lay board there are key men or women, who usually direct the trend of thought and often lead in the activities. It is these key individuals with whom contact must be made. It is almost impossible to sell an idea to a group when the key men are not in accord. It is easier to contact one or two individuals and sell the program to them than it is to convince a large group. Convince the key man and he will sell the ideas to the group much better than you can.

This is not as easy as it may seem. Do not be confused by appearances. The key man is not always the chairman or president of the group. He may be a person who shuns the limelight but who will always be found as a powerful influence behind the scenes. Solicitous inquiry will aid in finding the leader. Go slow. Be sure. Many a good program has fallen through because a mistake was made in picking the key man.

After the key man has been picked, go ahead; cultivate him; acquaint him with the official program and solicit his help in selling the proper ideas to his group. Contacts of this nature demand considerable diplomatic resourcefulness and must frequently be delegated to a third party. In that case, select someone who is acquainted with the program and induce him to make the contact.

After the contact has been made and the ideas have been sold, the catalogue, which has previously been set up, should be made more complete. Hold this catalogue or file as a ready reference to be used in coördinating the general program. Having thus catalogued the groups and their respective resources, a further study should be made of the general public health problems so that the resources of the proper groups may be utilized at the strategic time.

Do not expect lay groups to spend all their time and resources on the public health program; they probably have other interests—use common sense and caution not to over-promote.

On the other hand, some groups must be kept continually active to retain their interest. It is with these that the greatest difficulty is encountered. It means that practically each individual of such groups must be made to feel that he or she has a personal interest in and is an integral part of the program. Such members must be given specific tasks or responsibility which will help to sustain their interest; otherwise they lose enthusiasm. This soon results in a disintegration of activities and the program falls by the way. Loss of interest is largely the result of wrong leadership in the group.

Then again, we find the socially minded persons, those well meaning but often ill advised individuals who have an unquenchable urge to do something for the welfare of mankind. With these, an effort should be made to win sympathy and coöperation. A close study should be made of their plans and objectives so that their whole program can be clearly seen and evaluated. If the confidence of such individuals is gained, advice will usually be heeded and a program established which will agree with the ideas of the official agencies. If situations of this nature are not properly handled the overzealous leader may become impatient and start work independently through

agencies other than the official public health body. This invariably results in duplication and confusion.

Voluntary health organizations are a great stimulus to the promotion of public health and many of the present accepted principles and procedures owe their origin to such lay groups. If they are properly contacted and their resources catalogued, much good work can be accomplished through them in attaining the objective. However, over-enthusiasm in some particular phase of public health work and pressure by such groups have been responsible for many unbalanced programs. The programs of lay groups should be planned so that they coöperate with the official public health agency and not aim to direct the official activities. Friction may be avoided and coördination established when this principle is recognized and respected, namely, that the official public health agency is the body which is responsible for the public health activities in the community.

Governor Lehman on Syphilis Control

UP to now, false modesty has interfered with the free discussion of syphilis, and although its ravages have been present on every hand, we have not been as well informed regarding them as we should be. I am glad to have had a part in the lifting of the veil of secrecy, and the breaking up of the conspiracy of silence in New York State. Let me assure you that once the facts now being circulated become generally known the humanitarian appeal of syphilis will be fully as great, or even greater than that presented by any other communicable disease. . . .

I am informed that the State of New York is now spending $2,500,000 annually for the care and treatment of patients with syphilis of the brain in mental disease hospitals. If the cost of this single condition could be eliminated or materially reduced, larger expenditures even than those which state and local governments are making today would be fully warranted. Brain disease is only one of the end results of syphilis. Besides persons with this condition, state institutions harbor blind and crippled individuals and many other syphilis victims. If one could add to the cost of maintaining wards of the state, the sums spent for the treatment of the late results of syphilis in general hospitals, losses due to the disease in industry, the cost of accidents caused by persons with brain infections, and the cost of the removal from society by death or disabling illness of workers during their productive years, the total would reach an appalling figure.

I am convinced that it is vastly cheaper to attempt to do away with syphilis than to allow this pestilence to continue unchecked. Having these firm convictions, I should as Governor have failed in my duty to the citizens of New York State if I had not fully supported the new syphilis control program when first proposed by Dr. Parran. This support I have continued, and intend to continue as long as funds appropriated for syphilis control are wisely spent. — (Abst.) Governor Lehman's speech on Syphilis Control at the Albany Syphilis Control Institute, Feb. 4, 1937.

ractical Value and Significance of the Complement-Fixation Reaction in Amebiasis*

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THE complement-fixation test for amebiasis was placed on a practical clinical basis by Craig,[1-6] and his observations have since been corroborated by Sherwood and Heathman,[9] Spector,[10], Kiefer,[8] Tsuchiya,[13] and Weiss and Arnold.[14, 15] The specificity of the reaction as a diagnostic measure in amebiasis has been satisfactorily established, and the reports of its use indicate that it is of considerable value in the diagnosis of obscure cases in which it is difficult or impossible to find *Endamoeba histolytica* in the stools, and in following the effect of treatment. In the reports thus far published the reaction has been positive in nearly all cases of clinical amebic dysentery and amebic abscess of the liver, in persons with obscure symptoms due to amebic infection, and in most infected persons who present no clinical symptoms.

The antigen for the test is usually made from cultures of *E. histolytica,* although Craig [7] has prepared a satisfactory antigen from the mucoid material removed from the intestines of experimentally infected dogs. Alcoholic extracts of cultures prepared by various methods have proved useful. No antigen has yet been developed, however, with as high an antigenic titer as the antigen ordinarily used for the Wassermann reaction. Craig has used the antihuman hemolytic system, but others who have published reports have preferred the antisheep hemolytic system because of greater convenience. Only those reactions which show a 3+ or 4+ inhibition of hemolysis on a 4+ basis are generally interpreted as positive. In following courses of treatment, however, 1+ and 2+ reactions have been considered significant. We have performed this test on the blood of 171 humans, 39 dogs, 25 *Macacus rhesus* monkeys, and 2 rabbits. The purpose of this report is to present the results of these tests and to discuss their significance in relation to the invasion of the tissues of the host by *Endamoeba histolytica.*

METHODS

We have employed various antigens in the tests to be reported. Our first antigen was furnished by Craig, which was satisfactory except for its low antigenic titer. Our second was a lipoid antigen prepared according to the

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method of Sherwood and Heathman.[9] This antigen had a higher antigenic titer but was highly anticomplementary. Our third antigen was sent to us by Captain William S. Stone of the Army Medical School, and was prepared from culture cysts by alcohol extraction according to the method described by him.[12] This antigen had a satisfactory antigenic titer and did not become anticomplementary until about 9 months after we received it. For the past 6 months we have used an antigen similar to Stone's except that it has been prepared from motile culture amebae instead of from cysts. The antigen for our routine tests was made from our strain B–1 which has shown a high degree of pathogenicity for kittens.

We have prepared similar antigens from another human strain (our strain A–1), having a low degree of pathogenicity for kittens, and also from a monkey strain (N.R.S.) sent to us by Clifford Dobell of London and which has shown a very low degree of pathogenicity for kittens. These gave approximately the same antigenic titrations as the antigen prepared from strain B–1, indicating that there seems to be no antigenic difference between these human and monkey strains of *E. histolytica*. In performing the tests we have used the antisheep hemolytic system with preliminary incubation at refrigerator temperature. Complement, amboceptor, and sheep cells have been obtained from the Wassermann laboratory of the Vanderbilt Hospital where the titration of these substances was performed.

RESULTS

Complement-fixation tests on animals—A brief summary of our results in animals will be sufficient for this presentation. Dogs consistently developed amebic dysentery when inoculated with *E. histolytica* and concurrently developed positive complement-fixation reactions. Spontaneous elimination of the intestinal infection in one dog was associated with loss of complement-fixation. Rabbits (which are not susceptible to intestinal infection with *E. histolytica*) developed positive complement-fixation reactions following the intraperitoneal injection of *E. histolytica* extracts, and these reactions persisted for a period of at least 7 months. *Macacus rhesus* monkeys having natural intestinal infections with *E. histolytica* or experimentally infected with a human strain did not give positive complement-fixation reactions, with one exception, and showed no macroscopic or microscopic amebic lesions at autopsy. The one exception was an experimentally infected monkey which gave one positive reaction on the 5th test performed, but negative reactions on 11 subsequent tests, and no lesions at autopsy. Monkeys inoculated parenterally with ameba extracts developed complement fixing bodies which were evanescent in 3 animals and persistent in 1 of 2 monkeys having an intestinal infection without lesions. In all of these observations on animals, with the possible exception of 1 test on 1 of the monkeys, a positive complement-fixation test was associated with invasion of tissue by the amebae or injection of ameba extract; and a negative reaction was associated with absence of demonstrable tissue invasion.

Complement-fixation tests on man—Our tests in man will be divided into 2 groups; (1) tests performed on patients and other persons connected with the medical school and hospital, and (2) tests performed on a group of symptomless "carriers" of *E. histolytica* residing in a rural community.

Table I shows the results of tests in both groups. All of the 21 persons giving positive complement-fixation reactions were in the medical school and hospital group. It will be seen that

TABLE I

Results of Complement-Fixation Tests for Amebiasis in Man

Stool Examination for E. histolytica	Complement-Fixation for Amebiasis		
	Positive	Negative	
		Hospital	Jackson County
Positive	17	7	16
Negative	4	50	77
Total	21	57	93

of these 21 persons 17 showed *E. histolytica* in the stools while 4 did not. Among those giving negative complement-fixation, 7 of the hospital group and 16 of the rural community group harbored *E. histolytica* in the stools.

Table II gives an analysis of the clinical symptoms in cases giving a positive complement-fixation reaction. We are particularly interested in the group showing positive complement-fixation in the absence of demonstrable *E. histolytica* in the stools. The case listed as amebic abscess of the liver was in a white man, 29 years old, who had had an amebic liver abscess which had been drained on two occasions. He returned to the hospital 5 years after the second drainage with slight pain in the right lower chest and right upper abdomen. His symptoms subsided upon rest in bed. Because of the positive complement-fixation test the patient was treated with carbarsone by mouth, but the complement-fixation reaction was again positive 4 months later although the symptoms had not recurred. We believe this patient probably has a persistent focus of amebic infection in the liver. The 3 cases listed as ulcerative colitis were treated with carbarsone and their complement-fixation tests became negative coincident with marked clinical improvement, indicating that they were probably amebic in origin. Kiefer,[8] Craig,[5] and Tsuchiya,[13] have reported similar cases.

The other group demanding special consideration consists of the cases in Table I in which the stools contained *E. histolytica* but the complement-fixation test was negative. The tests on the 7 persons in the hospital group were performed because *E. histolytica* had already been found in the stools. None of these presented symptoms suggestive of an amebic origin, and in the light of our observations on monkeys, it seems probable that they were cases of intestinal amebiasis in which the amebae were present in the lumen of the intestine but had not invaded the tissues.

Our previous studies in which the pathogenicity of various strains of *E. histolytica* was determined by means of kitten inoculation suggested that the invasive tendency of different strains varies widely. In order to study this point further we obtained blood and stool specimens from 93 persons living in a community in Jackson County, Tenn., where previous observations had shown that about 40 per cent of the inhabitants harbored *E. histolytica* although active amebic dysentery was

TABLE II

Clinical Symptoms in Cases Giving Positive Complement-Fixation Reactions for Amebiasis

Clinical Symptoms	Stool Examination for E. histolytica	
	Positive	Negative
Active Amebic Dysentery	3	0
Amebic Abscess of Liver or Hepatitis	1	1
Ulcerative Colitis	0	3
Indefinite Abdominal Symptoms	4	0
Other Clinical Symptoms	8	0
No Clinical Symptoms	1	0
Total	17	4

entirely absent from the community. Experimental study of 2 strains of *E. histolytica* from this community had shown that the strains usually produced mild lesions in kittens. The results of our blood and stool examinations in this community are shown in the third column of Table I. All of the 93 persons gave negative complement-fixation, although 16 of them were found to harbor *E. histolytica* in the stools. These tests were performed not only with the antigen prepared from our more pathogenic (B–1) strain but with the antigen prepared from strain A–1 which had been obtained from this community. Strongly positive reactions with the known positive sera used as controls in this series of tests assured us that the completely negative result was not due to faulty technic. These findings not only confirm our previous observations as to the mildly pathogenic nature of the strains of *E. histolytica* present in this community, but also suggest that the reason for the absence of symptoms of amebic infection in the community is that, in many cases at least, the amebae did not invade the tissues at all, but multiplied in the lumen of the intestine, as they did in our monkeys, and as other species of amebae, such as *E. coli,* are known to do in man.

Large and small races of E. histolytica—Spector [11] has recently reported that, in her observations, the small races of *E. histolytica,* that is, those whose cysts measured up to 12 μ in diameter, did not give rise to positive complement-fixation reactions, whereas large races gave rise to positive reactions in almost every instance. Our experience does not coincide with this. We have classified as small races those whose cysts measured up to 9 μ in diameter, but even with this more restricted grouping 4 of our 17 patients who gave positive complement-fixation reactions showed only the small race in the stools. Among our cases harboring *E. histolytica* with negative complement-fixation reactions, 18 showed the large race and 5 the small race in the stools. All of our naturally infected monkeys have harbored large races of *E. histolytica* and a large race was employed in our experimental infections in monkeys, and in these animals complement-fixation was almost uniformly negative. Our observations suggest that the size of the cysts passed in the stools is not a reliable criterion on which to base the pathogenicity of strains of *E. histolytica.* Apparently the small races as well as the large ones may invade the tissues.

DISCUSSION

Our use of the complement-fixation test in amebiasis has convinced us that it has a practical value in detecting obscure cases of infection with the dysentery ameba and that it could with advantage be used more widely in hospitals and in private practice. The test is still, however, in the developmental stage, and may easily fall into disrepute if it is performed by inexperienced persons.

Craig [6] has called attention to the value of the test in following the effect of treatment. All of our positive cases which were treated and followed with the complement-fixation test ultimately gave negative reactions. Although the reaction may again become positive with a relapse, a persistently negative reaction probably indicates cure. A persistently positive reaction, as was obtained in our case of recurrent amebic abscess of the liver, probably indicates the persistence of an amebic focus in the body.

A negative complement-fixation reaction is of particular value in two groups of patients: (1) patients with chronic diarrhea or other symptoms suggestive

of amebiasis, in whose stools *E. histolytica* cannot be found; (2) patients formerly known to have had amebic dysentery, who continue to have vague abdominal symptoms, or who fear they are not cured. Such instances are numerous among persons who have lived in the tropics. In both of these groups the negative blood reaction gives reasonable assurance that amebic infection is absent.

Craig,[6] Spector,[10] and Tsuchiya[13] have reported cases in which the stools contained *E. histolytica* but the complement-fixation test was negative. Some of these were cases of acute amebic dysentery which would probably have developed positive reactions if the infection had persisted beyond the acute stage. Craig reported 1 case diagnosed as amebic abscess of the liver with *E. histolytica* in the stools, but giving a negative complement-fixation reaction. This probably represents a very small group of individuals incapable of antibody response to infection. The other cases reported by these authors as having *E. histolytica* in the stools with a negative complement-fixation reaction presented either indefinite symptoms or no symptoms. Our observations add 23 cases to this group. In the light of our observations on monkeys we believe that these persons harbored *E. histolytica* in the lumen of the intestine without invasion of the tissues. The duration of such infections in man has not been determined, but it is conceivable that they may be of long duration as similar infections in monkeys appear to be.

Despite our evidence that *E. histolytica* may sometimes exist in the intestine without the production of lesions, every case in which this ameba is found in the stools should be treated with an amebacidal drug, both for protection of the individual and for the protection of others. A single strain of *E. histolytica* may produce no symptoms in one individual and severe amebic dysentery or abscess of the liver in another, and it is impossible to predict what will happen in any one case.

Finally it must be emphasized that the complement-fixation test should not replace diligent search for *E. histolytica* in the stools in suspected cases. A positive complement-fixation test is only presumptive or confirmatory evidence of amebic infection. Accurate diagnosis can be based only upon identification of *E. histolytica* itself in the stools or in the tissues of the body.

SUMMARY AND CONCLUSIONS

1. Dogs experimentally infected with *E. histolytica* uniformly developed a positive complement-fixation reaction for amebiasis associated with active amebic dysentery.

2. Rabbits injected with antigen prepared from *E. histolytica* developed a persistently positive complement-fixation reaction.

3. *Macacus rhesus* monkeys having natural or experimental intestinal infections with *E. histolytica* almost uniformly showed negative complement-fixation reactions, and such reactions were associated with absence of any demonstrable tissue invasion by the amebae.

4. Monkeys receiving parenteral injections of antigen prepared from *E. histolytica* developed positive complement-fixation reactions which usually were of short duration.

5. Most human infections with *E. histolytica* encountered in medical practice were associated with positive complement-fixation reactions.

6. Some obscure clinical cases in which *E. histolytica* could not be demonstrated in the stools, showed positive complement-fixation, and were benefitted by antiamebic treatment, indicating that they were actually cases of amebic infection.

7. The complement-fixation test is of value in following the effect of treatment in amebiasis and in determining whether residual symptoms are due to the persistence of the amebic infection.

8. A significant number of persons harboring *E histolytica* in the intestine gave negative complement-fixation reactions. In addition to 7 such cases encountered in our hospital tests, 16 were encountered in a series of tests on the inhabitants of a community in which a high incidence of *E. histolytica*:

was present without the occurrence of amebic dysentery.

9. We conclude from these observations that a positive complement-fixation reaction in man is presumptive evidence of the presence of amebae in the tissues, and that most infected persons giving a negative reaction (except those in the early stage of the infection) harbor the parasite only in the lumen of the intestine without tissue invasion.

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Mothers' Milk

DR. Shirley W. Wynne,* President of the Children's Welfare Federation, New York, N. Y., announced the results of a survey conducted by the Mothers' Milk Bureau which revealed that 1,356,393 ounces of life-preserving mothers' milk was supplied by the bureau to more than 5,000 prematurely-born and dangerously ill babies from 1921 up to and including 1936. Thirteen hundred and forty-one mother-donors furnished this enormous quantity of mothers' milk, which can be secured only when prescribed by a physician.

The Mothers' Milk Bureau was founded in 1921 by Dr. Henry Dwight Chapin. Its activities are now directed by Helen Foley Leighty, R.N.

* Fellow A.P.H.A.

An Additional Factor to be Considered in Calculating Automobile Fatality Rates*

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THE prevailing method for calculating mortality rates for deaths due to automobile accidents, as employed by the various public health agencies throughout the country generally, uses the total population as a basis. This may be a convenient method, but it is not entirely adequate, as can readily be seen by examining the ways in which the residents of a city contribute to traffic fatalities.

A city without motor cars could, obviously, have no motor fatalities. Naturally, it follows that cities with few motor cars, even though the population be very large, might have a few fatalities, and that the number of such deaths would increase as the number of motor cars traveling the streets increased.

On the other hand, motor cars could not inflict injuries upon pedestrians if the cities were depopulated. Consequently, we have two outstanding factors to deal with; namely, the number of motor cars as the prime factor, and population as the contributing factor. Thus it is apparent that computing death rates from automobile injuries on a population basis alone, without giving consideration to the number of motor cars in the city, may lead to incorrect conclusions.

We are forced to conclude that a method which ignores the number of motor cars, or a method which ignores the population, is inadequate.

It is really necessary, for accuracy, that both factors be included in the method of computing rates. This could be termed a car-population unit method. This name, in itself, implies that both the number of cars and the total population are taken into consideration. The rate, by this method, is determined by dividing the number of automobile deaths by the number of automobiles, times the population. This may be expressed by the equation $\frac{D}{CP}$ in which D represents number of deaths, C the number of cars, and P the population.

We have made up a table of the rates in the 13 largest cities, using the following two methods:

1. Rate per 100,000 population
2. Rate per 100 billion car-population unit

On this list, Milwaukee, Cleveland, and Los Angeles may serve as excellent illustrations.

By the prevailing method of computation, Milwaukee, in 1935, had the

* Read before the Vital Statistics Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 20, 1936.

TABLE I

Automobile Fatality Rates in 13 Large Cities

1935

No.	City	Estimated Population	Total Deaths	Death Rate per 100,000 Population	Total * Motor Cars (In thousands)	Death Rate per 100 Billion Car Population Unit	Position of City Based on Preceding Column
1.	Milwaukee	605,000	74	12.2	129	95	7
2.	New York	7,601,575	1,078	14.2	826	17	1
3.	Philadelphia	2,016,103	324	16.1	284	57	4
4.	Baltimore	841,264	138	16.4	142	116	9
5.	San Francisco	693,000	124	17.9	155	115	8
6.	Boston	798,568	161	20.2	105	192	11
7.	Detroit	1,568,662	339	21.6	385	56	3
8.	Chicago	3,490,700	780	22.3	451	50	2
9.	St. Louis	847,092	199	23.5	174	135	10
10.	Pittsburgh	685,800	179	26.1	113	231	13
11.	Buffalo	589,316	158	26.8	135	199	12
12.	Cleveland	929,200	249	26.8	292	92	6
13.	Los Angeles	1,295,629	454	35.0	451	78	5

* Passenger cars, trucks, buses, motorcycles (trailers excluded)

lowest automobile mortality rate, 12.2; Cleveland was 12th on the list with 26.8; and Los Angeles was 13th with 35.0.

In arriving at these rates, the number of motor cars in the 3 cities was, of course, not taken into consideration. The fact that Los Angeles had 3½ times, and Cleveland 2¼ times as many cars as Milwaukee, was ignored.

TABLE II

Automobile Fatality Rates in Chicago

1921–1935

Year	Estimated Population	Total Deaths	Death Rate per 100,000 Population	Total Motor Cars (In thousands)	Death Rate per 100 Billion Car Population Unit
1921	2,780,655	541	19.5	170	114
1922	2,833,288	626	22.1	210	105
1923	2,886,971	522	18.1	261	69
1924	2,939,605	489	16.6	308	54
1925	3,063,855	533	17.4	340	51
1926	3,128,964	592	18.9	370	51
1927	3,195,514	797	25.0	388	64
1928	3,262,448	887	27.2	416	65
1929	3,327,607	767	23.0	461	50
1930	3,392,700	843	24.8	465	53
1931	3,458,100	978	28.3	481	59
1932	3,523,400	878	24.9	450	77
1933	3,588,700	911	25.4	417	61
1934	3,490,700	1,003	28.7	418	96
1935	3,490,700	780	22.3	451	50

By employing the method just summed up in the formula $\frac{D}{CP}$ we arrive at the following results:

Milwaukee
95 per 100 billion car-population units
Cleveland
92 per 100 billion car-population units
Los Angeles
78 per 100 billion car-population units

It is evident that with two factors taken into consideration, the rates for the 3 cities are of about the same magnitude, with Los Angeles having the best standing instead of the worst.

The inadequacy of the prevailing method is even better illustrated in the computation of Chicago automobile fatality rates, as shown in Table II.

In 1921, there were 170,000 motor vehicles of all sorts in the streets of Chicago. Five hundred and forty-one persons lost their lives through automobile accidents, and the mortality rate was 19.5 per 100,000 population.

Five years later, in 1926, the number of cars increased to more than double, 118 per cent, and the population increased by 350,000. During that year, 592 persons were killed by automobiles, and the rate is given as 18.9, practically the same as in 1921. The fact that there were 370,000 automobiles in the streets, instead of 170,000, was not taken into account.

The car-population unit method of computation, by taking into consideration both the increased population and the increased number of cars, finds that, in 1921, the rate was 114 per 100 billion car-population unit, and in 1926, 51, instead of rates that are practically the same, when the prevailing method is employed.

In conclusion: (1) we feel that, by the method just outlined, a more accurate and fairer rate is arrived at, because of the fact that at least two contributing factors are taken into consideration, rather than one; (2) that by the new method, results of safety campaigns are more fairly evaluated than by the present-day method.

Hermann M. Biggs Lecture

IN memory of Dr. Hermann Michael Biggs, one meeting of the New York Academy of Medicine each year is devoted to the consideration of some public health problem. This lecture is given under the auspices of the Committee on Public Health Relations of the Academy and is open to the public. This year's lecture was given by Professor Henry C. Sherman of the Department of Chemistry of Columbia University, who spoke on "The Bearing of the Results of Recent Studies in Nutrition on Health and on Length of Life." The address was in the Academy of Medicine, April 1.

EDITORIAL SECTION

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ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE

ONE of the most interesting features of the *Annual Report of the Public Health Service* for 1936 concerns the administration by the Service under title VI of the Social Security Act, begun February 1, 1936. The grants-in-aid to the states have been $3,333,000, of which $2,451,140.79 has actually been paid to 51 states and territories according to the budgets submitted to the Surgeon General and approved by him. The remainder has been carried forward into the appropriation for 1937.

It will be remembered that the distribution to the states was based on (1) population, (2) special health problems, (3) economic need, and (4) training of public health personnel. The provisions put in the hands of our Public Health Service a large measure of control over state boards of health which has evidently been put to good use. We are told:

> 19 states which did not already have such service set up central facilities for the promotion and supervision of local health administration, 33 state health departments strengthened their public health engineering forces, 11 added new units for the investigation and promotion of industrial hygiene, preventable disease control groups were materially strengthened in 24 states, in 27 states the laboratory facilities were augmented, 19 states made needed improvements to the personnel and equipment for vital statistics, public health nursing was strengthened either directly or indirectly in practically all the states, 11 states provided special measures for syphilis control and 13 for the control of tuberculosis

Under item 2, Special health problems, we are told that emphasis has been laid on hookworm control, typhus, trachoma, psittacosis, cancer, mental hygiene, and rodent plague. In summary, the state health organizations have been strengthened in all but 5 states, and the local health services aided in all but 2.

It has been repeatedly said, and truly, that we know much more than we have been able to put into effect, and that if we applied the knowledge in our possession

the incidence of contagious diseases especially would be tremendously lessened It is evident that putting knowledge into practical public health work should be in the hands of trained personnel—those having not only what might be called book knowledge of fundamentals, but trained in methods and administrative practices. One man with such training will get more public health out of a given sum of money than 10 others whose heads may be full of theories as well as facts, but lacking administrative ability and training.

In June, 1935, the State and Territorial Health Officers drafted a set of qualification standards for public health employees which was approved by the Surgeon General. For the specific purpose of giving technical training for doctors, nurses, engineers, etc., $416,666 was allotted for 5 months, on the basis of $1,000,000 a year. Eight training centers have been subsidized.

The need for trained personnel for public health work has been emphasized over many years. Our peculiar political set up has deterred many of those interested in public health from taking it up as a profession, since in none of our states is the principle of tenure of office recognized. Health positions which amount to anything are political plums. Officers who have held their places from one administration to another over any length of time can be counted on the fingers of one hand—no doubt because they possessed special qualifications not found in the average health worker. With the impetus and encouragement given by the Social Security Act, we cannot but believe that public health will become more popular in all the professions engaged in it, and we dare hope that within a very few years we will approach the stability found in England, for example.

The method of allocation of these funds to the states has had educational value for legislators, since 50 per cent of the sum allocated was made available through matching existing funds for public health work and 50 per cent by matching new appropriations from the state and local sources.

In looking over the list of states and their allotments, one is struck by the comparatively large amounts given to the southern states: Alabama, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia. These allocations have been made chiefly under (2) Special health problems, and (3) Economic need, in which the per capita income of the state was taken into consideration.

Seventeen states have established industrial hygiene units in their departments of health. Before the passage of the Social Security Act, $37,788 was being spent for industrial hygiene activities, whereas in these 17 states the new budgets carry approximately $330,357. With the small expenditure of 14 mills per worker, this means that some 24 million gainful workers now have services available in this field by health agencies.

Great opportunities carry great responsibilities. The administration of this Act with the proportional tremendous increases in funds available for public health work have placed on our Public Health Service a great responsibility. That the Service has risen to this opportunity and responsibility is evident by the report before us, and we have no doubt that the careful supervision and good judgment shown in inaugurating the administration of this Act will be continued.*

* It will be remembered that the report of the Public Health Service does not tell the whole story, as funds are available and have been distributed through other agencies—for example, the Children's Bureau.

THE MENACE OF AUTOMOBILE TRAILERS

A VERY small amount of travel over our automobile highways is needed to demonstrate that a new problem in public health has arisen—the automobile trailer.* During what may be called the migratory periods, spring and fall, one may pass on the highways in some parts of the country as many as 20 of these vehicles in a drive of 100 miles. There is certainly not a health officer of any state in the Union who has not come up against the problems of sanitation created by these automobile nomads. It is said that some live the year around in their trailers, going from one part of the country to the other. Some of these follow regular routes of travel, stopping for the night where night catches them. Some are operated from a center by individuals for fishing and hunting trips. Those trailers which follow the highways present the greatest health problem.

The matter has been well considered in *Public Health Reports*.[1] Health officers are concerned about the milk and water supplies used by the occupants of the trailers, some of which are equipped with ice chests for the preservation of these articles and foods. However, the health of these individuals is not much of a public health problem except for the necessity of disposing of their excreta, which constitutes at best a nuisance, and at worst a distinct menace to health. Many of the trailers are luxurious, and have toilet compartments with tight metal cans provided with chemicals which are said to disinfect the excreta thoroughly. However, with the constantly increasing number of trailers, and therefore passengers, it is manifestly impossible to allow these cans to be emptied and garbage thrown out along the highways or in the parks of our cities. It is reported that provisions are being made by a number of cities for the parking of these trailers in places provided with sanitary sewerage facilities.† The great majority of our states are looking after the water supplies, and it is reasonably safe to drink from such sources anywhere in the country. Safe water supplies are so marked by state boards of health. The Public Health Service points out the necessity of giving consideration to providing roadside facilities for the sanitary disposal of human waste and suggests that city and county departments of health could construct disposal systems near roads frequented by auto trailers.

It seems to us that there should be concerted action by the health officers of the states in the Union, especially those which carry the largest loads, as those leading from the North to the South, for, like tramps, a large proportion of this trailer population seeks the South in winter and the North in summer. Certainly in a country like ours, made up of such a large number of states, uniform regulations are most important.

The City and County of San Francisco, under Dr. J. C. Geiger, as Director of Health, has issued a *Sanitary Code for Automobile Trailers*, which contains many wise provisions and suggestions.

The tremendous popularity of this method of living and of traveling is suggested by the apparently authentic reports that a number of the large automobile companies are seriously considering the building of trailers as accessories to the car output. To the layman it seems curious that these well equipped companies

* A recent survey by the American Municipal Association, the Society of Planning Officials, the American Public Welfare Association, and the National Association of Housing Officials indicates that there will be 400,000 automobile trailers in use in the summer of 1937, housing 1,250,000 persons

† Miami, Florida, now has 13 licensed trailer camps, with a present population of 5,000 persons, which is expected to run to 7,000 later in the season.

would allow this business, already large, to be run by independents. Other problems have arisen which need concern us only indirectly. In one state the legal question had to be settled as to whether a trailer continuously occupied and remaining on one stand for a long time was a vehicle or a residence. If the latter, it fell under the city's jurisdiction and regulations. How long may a trailer stay in one place and still be a vehicle? However, our interest is in public health; the carrying of diseases from one part of the country by the passengers in these vehicles, which are under no sort of supervision at present, and the disposal of garbage and excreta along the roads and in camps and city parks, which to a great extent, lack adequate facilities for disposal.

REFERENCE

1. *Pub. Health Rep.*, Dec. 25, 1936, pp. 1791–1792.

AMERICAN PUBLIC HEALTH—A BRITISH APPRAISAL

THE system of public health administration in this country and its results frequently evoke comments from distinguished foreign observers. Sometimes enthusiastic, sometimes quizzical, these comments are always interesting and instructive, for it is useful to us to see things through the eyes of others.

In a recent issue of the *British Medical Journal*[1] there is an editorial entitled "American Public Health," which is based on facts given in a series of articles in that Journal by Professor R. M. F. Picken, a Welsh sanitarian who visited the United States under the auspices of the League of Nations, and made a survey of our public health activities.

This editorial points out that public health arrangements as conducted by our 48 sovereign states exhibit a chequered pattern,

> . . . altering from place to place and sometimes leaving the observer uncertain whether the variations noted are to be ascribed to actual differences in the health problems existing or to differing points of view of the governing bodies concerned.

The general practitioner is more effectively used in America than in England as the key man in public health, according to this editorial, which states, however, that relatively few of our medical health officers in cities and counties have had special training or possess qualifications in public health. There is also said to be considerable variation in the scope of existing courses of instruction for health officers, the educational value of which is unquestioned, but the vocational value of which may be doubtful. The teaching of preventive medicine in certain institutions, particularly Yale and Vanderbilt, is, nevertheless, worthy of emulation in the British medical schools.

Although much has been accomplished in the control of communicable diseases, as by widespread immunization against diphtheria, there has been no abatement in the prevalence of venereal disease in the United States, which confirms the view of many British administrators that the ethical and educational approach is the only way.

In addition to these matters, the editorial discusses the operation of our Social Security Act, mentions the tendency of American hospital construction to depart from the large ward system, and decries the use of persistent monthly letters to expectant mothers, which, it says, "need a light hand."

REFERENCE

1. American Public Health. Edit. *Brit. M. J.*, Oct. 31, 1936, p. 873.

Letter from Great Britain

THE UNLUCKY LONDONER

It is the publication recently here of a particular volume and the discussion that has taken place around it, coupled with some slight acquaintance with the press and literature of certain European countries very much in our news, that inspires me to remark that it is only under a democratic régime, such as operates in the United States and Great Britain, for example, where the bulk of the people are not too extravagantly nation-conscious, that it is open to writers often, or indeed ever, to throw wide the door of the skeleton cupboard and expose some of what they, at any rate, regard as the more inexcusably unpleasant contents. The volume referred to bears the title "Metropolitan Man." Modestly it proclaims itself an exposure of "needless deaths in English homes, of administrative chaos in English towns, and muddle in English business." London is dragged in because the metropolis and its "lure" are blamed as constituting "a grave and harmful factor in the life of the country." The main object of the author's quest, it appears, was to discover how happy Londoners really were, how fully they enjoyed the fruits of modern knowledge, and how true the legend of their prosperity. Obviously setting out upon his quest full of the belief that there was no happiness anywhere in any Londoner, it is not strange that he secured complete confirmation of his view. His own extreme unhappiness clearly also was intensified as a result of his quest. This one gathers from the manner in which he allows his passion to tower on account of the absence of a law requiring the universal wrapping of bread and the fineness of his scorn for town councillors because of their failure to meet the expectations of the provincial invaders and pave the streets with gold.

A FIGURE OR TWO

Much of the information with which authors of such volumes as *Metropolitan Man* fill their pages, eking it out with an exaggerating emphasis here and there and a multitude of florid phrases and threats to be actively sick or to succumb to a broken heart because such things are, come from official publications of one sort and another. Amongst them one that is very important, that must indeed be a perfect godsend both to those who wish to learn something of what is being done and of progress made and to such as would represent the metropolis as a glorified refuse heap, crawling with paupers and the acutely and chronically diseased is the so-called *Statistical Abstract for London*, published from time to time by the London County Council. The latest of these has reference to the period of 1926–1936 and, in regard to a number of matters affecting the public health, reveals that progress towards betterment in result or in provision has been made. The population of the Administrative County at 1935 was estimated at 4,185,000. This is just about half the population — over 8,000,000 — of Greater London, which heads the list of great cities so far as population is concerned, though the area covered is more than twice as great as that of New York, which comes next with just under 7,000,000. The total live births in 1935 numbered 55,780, the rate being 13.3. In 1925 there were 82,401

births, giving a rate of 17.9. The general death rate—11.4—for 1935 is 0.5 per 1,000 lower than that for 1925. Of special death rates, that showing the most marked decrease is the infant mortality rate, the 68 per 1,000 births of 1925 having become 58 per 1,000 in 1935. Deaths from tuberculosis of the respiratory system have fallen from 4,066 in 1926 to 2,847 in 1935, and the rate from 0.88 to 0.68. Deaths and death rates from heart disease as well as those from cancer have gone up. In 1935 the figures for heart disease were 13,067 and 3.12 as against 8,261 and 1.79 in 1926. The cancer figures were 6,720 and 1.46 in 1926 and in 1935, 7,091 and 1.69. Conditions showing interesting and, to an extent, perhaps, unexpectedly reduced rates are bronchitis and pneumonia, the former to 0.36 in 1935 from 0.79 in 1926, and the latter from 0.94 to 0.67.

SAFETY OF THE STREETS

Other disease and death figures that may be mentioned are those in relation to infectious disease, in regard to which it is shown that of cases admitted to hospital the totals for 1926 (30,403) and for 1935 (30,664) are very similar. How very marked a change has taken place in relation to street safety is revealed in a table setting out the number of deaths and accidents year by year and the type of vehicle involved. The total for injuries and deaths in 1925 was 41,079 (killed 853) and in 1935, 56,555 (1,109 killed). As to type of vehicle the figures show an increase in the number of private cars concerned from 13,895 in 1926 to 18,347 in 1935. Having regard to what appears to be a comparative scarcity of such vehicles on London streets, it is a little surprising to learn that in 1935 accidents in which pedal cycles were involved were almost exactly twice as numerous as in 1925—16,777 as against 8,313. Motor cycle accidents, that numbered 8,726 in 1926, gave 6,618 in 1935.

As indicating the extraordinary variety of records kept in the metropolis and that have been drawn upon in preparing this abstract, I find on one page, in addition to tables showing the number of units of electricity generated and sold by municipal and company undertakings, others setting out the number of aliens, and the extent of the work done year by year by local authorities, the county council, housing trusts, and private enterprise with a view to solving the housing problem. Elsewhere there are figures relating to unemployment in particular trades; the average daily supply of water derived from the Thames and other sources (in 1935, 277,395 million gallons) and the average daily supply per head of the population (36.5 gallons); the number of vessels arriving at and departing from the Port of London, and the revenue (£5,718,524) and expenditure (£5,714,794) in 1934–1935 of the Port of London Authority.

THE MONEY SIDE

Of figures relating to rates and rating, incomings and outgoings, there are, of course, many. In 1934–1935, it seems, the total aggregate expenditure by the County Council on the various works and duties in which they are concerned was £154,272,153. In addition, of course, there were expenditures by the various local authorities — city and borough councils—numbering in all 28, amounting in a number of cases to over a million pounds sterling. The total amount expended, therefore, would probably be not far short of £200,000,000. Towards this the total amount collected in the form of rates is between 28 and 29 million pounds sterling. The services upon which the largest sums were expended were education (about 26 millions) and housing (about 44

millions). Towards public assistance the amount expended was over 2½ millions sterling. In relation to public assistance a great variety of work is done in institutions, as domiciliary relief, on behalf of casuals, and so on, the total for whom provision was made and given relief per 1,000 of the population in 1936 being 30.9. This figure is mentioned because it is one with which much play is made by the writers of books of the type of *Metropolitan Man,* regarding it apparently as an added reason for counting civilization as a failure and quite overlooking the possibility of accepting it as an indication that there exists and is in operation in the metropolis a very complete and active organization for succoring the poor, who, it appears, must be always with us. Most of the statistical and other matter contained in the abstract, though it may interest a wider audience, is intended mainly for the instruction and guidance of those of us here who may be interested and curious. It is because of this and because I fear I may have bored you with the quotations I have made that I feel I must offer an apology.

GENERAL AND SPECIAL HOSPITALS IN LONDON

Another interesting report, relating to work done in the metropolis, issued by the London County Council is that of Sir Frederick Menzies, the County Medical Officer of Health and School Medical Officer, on general and special hospitals. In the general hospitals division there are 43 hospitals and institutions, containing a total bed accommodation of 25,664. One of these hospitals is for ophthalmia neonatorum and young children suffering from congenital syphilis and valvo-vaginitis. In another there has been established the British Post-Graduate Medical School, which is attracting students not only from overseas Britain but, to use an expression coined by the late King George V, "from regions even more widely spread." Included amongst those who joined almost immediately after the school opened were five students from the United States. Actually it is not only at this particular hospital that medical teaching is done. Sir Frederick Menzies, in fact, has shown himself greatly concerned to see that the fullest possible use is made of the vast amount of valuable clinical material in the hospitals. Now, as a a result of his efforts and influence, the London County Council have agreed to permit of instruction being given to medical students, undergraduate, and others, in some sixteen of the general hospitals and to permit of their affiliation to the voluntary hospital medical schools in the metropolis. In the special hospitals also, more particularly those provided for infectious diseases, of which there are sixteen, medical students receive the training in fevers which forms part of the curriculum they are compelled to follow. In the special hospitals division there are in all 31 hospitals, containing 14,386 beds. Included amongst the institutions, in addition to the 16 fever hospitals already mentioned, there is one for women and girls suffering from venereal disease, ten for tuberculosis (six for adults and four for children), while four are exclusively children's hospitals. The numbers dealt with in the general hospitals, as may be imagined, are considerable. Actually during 1935, 170,076 patients were admitted, and amongst other happenings it is recorded that 14,915 births took place. Several of the hospitals are rather old buildings but as a result largely of the initiative and enthusism displayed by Sir Frederick Menzies improvements are being made and a very high standard is being reached.

INSTRUCTION IN VENEREAL DISEASES

The admissions to the fever hospitals during 1935 numbered 30,664, though the year was generally one of low incidence of infectious disease. London fever hospitals have always been notable on account of the amount of more or less original research work done by the medical staffs on the material at their disposal. In 1935, amongst other publications and reports made, were one on "Carriers and Return Cases in Scarlet Fever," on "Whooping Cough," and on the "Nomenclature of Diphtheritic Infections." The admissions to the venereal diseases hospital of the County Council in 1935 numbered 387, 369 being adults and 18 infants. Further, 128 infants were born alive and 8 stillborn in the hospital. In this institution, as elsewhere, use is made of the material for teaching purposes and note is made of the fact that during the year lecture demonstrations were given to health visitor pupils, to members of a congress of inspectors of midwives, and to a party of industrial nurses. In addition to reporting with regard to hospitals and the multitude of interesting and important matters arising in connection with their conduct and operation, Sir Frederick deals also with other services provided by the Council, such as laboratories and ambulances. As with other figures submitted, it is possible to regard those relating to hospitals and the associated facilities from more angles than one. Perhaps, however, the most reasonable is that that permits of the acceptance of the view that on the part of the authorities in the metropolis there is a real and growing anxiety to meet the needs of London's sick in as large a degree as possible; and that while it may be a misfortune, or even to a certain small extent worse than a misfortune, that there are so many in need, it is a fortunate and wonderful thing that the provision for meeting it is so great. CHARLES PORTER, M.D.

LETTER TO THE EDITOR

TO THE EDITOR:

THE paper "An Additional Factor to be Considered in Calculating Automobile Fatality Rates" (Porsche and Stein) has come to my attention as a possible means of correcting the usual methods of computation for an important additional factor, namely, the number of motor vehicles, in the determination of a motor vehicle fatality rate. The usual methods of computation employ either a population, a gasoline consumption, or a vehicle registration basis. It is true, however, that motor vehicle fatalities may tend to vary with other such important factors as density of population, street mileage, and traffic of non-registered automobiles. The fundamental intention of the authors is defensible. However, there are two valid criticisms of the proposed plan in its present form.

First, while there is some logical basis for injecting an additional factor into the usual method of rate computation, a considerable amount of research by our engineering staff, as well as our statistical bureau, has revealed that, while motor vehicle fatalities may vary with any one of numerous factors, there is as yet no proof that motor vehicle fatalities tend to vary in accordance with the product of any two of these factors.

The second criticism of the method proposed deals with a fundamental statistical fallacy in the formula as now presented by the authors. According to this proposed plan the rate is computed from a fraction, in which motor vehicle fatalities are the numerator and the product of population and cars registered is the denominator. This formula has the effect of producing a fatality rate inversely proportional to the size of the city. I have made a test of the data from various cities and find that, as would be expected, the formula tends to rate the cities in order of size. The formula yields the following rather surprising results:

	Rate
A hypothetical city of 5,000	16,700
Evanston, Ill.	175
Wichita, Kans.	670
Chicago, Ill.	48
New York, N. Y.	18

Evanston, a city which has made an admirable safety record, has a motor vehicle fatality rate by this method which is approximately 4 times as large as that of Chicago. No informed person believes that this relationship really expresses the difference in traffic accident hazards between the two cities.

The statistical source of error in the formula is easily corrected by using as the denominator the geometric mean between the motor vehicle registration and the population or, in other words, the square root of the product of these two factors. Since there is logic supporting this method of computation, the formula, when statistically correct, may have some merit.

Since the National Safety Council is interested in every effort to reduce motor vehicle fatalities, we hope that further comments will be made on this or any other plan of computing more equitable motor vehicle fatality rates.

R. L. FORNEY,
Statistician,
National Safety Council

PUBLIC HEALTH EDUCATION*

Round Tables in New York City—During the season round tables on technics are held nearly every week by the New York Social Work Publicity Council. March and April included such topics as annual meetings, annual reports, mimeographing, words (to use and not to use), and discussion methods. Anyone planning a trip to New York will receive copy of the announcement by writing to editor of this department.

Members of the Social Work Publicity Council (130 E. 22d St., New York, N. Y.) who live or work in New Jersey, New York, or Connecticut will receive the monthly announcements automatically.

Health Tabloids — The special health edition season is at hand. First to arrive is the 40 page tabloid magazine, *Health,* of the *Sunday Register,* New Haven, Conn. Sunday, Feb. 28, 1937.

Yale faculty members, and state and local department staff members supplied most of the articles. Also present were Dr. Peter, Dr. Parran, and Dr. Craster. The Health Section was prepared under the editorial supervision of the public information assistant of the New Haven Health Department, Medical Material was approved by the City Medical Society Committee, and advertising was subject to approval by the secretary of the State Medical Society.

Without questioning the desirability of these special editions, we wish that in one city at least there could be a thorough-going, carefully planned study of what articles are read by those who buy the special edition. It would not be an easy job to handle.

The Day of the Week Please—It's a minute detail. Yet this detail does make it easier for those who receive your committee notices, and announcements of other meetings or events. Then the receivers don't need to hunt a calendar when looking at your notice away from their desks, or when it is received at their homes.

A Good Letter—Many letters asking for information and service fail to tell what is needed when writing an answer. Almost a model letter for one type of inquiry is that sent to national health agencies by Eva Moore Adams, supervisor, Health Education, Mississippi State Board of Health. It states clearly how the information will be used, who will get it, and their need, all given in straightforward fashion without any plea for special consideration. Here is the letter:

> The Division of Health Education in Mississippi is compiling a bibliography of material that will be suggestive and instructive to school teachers throughout the state. Our budget does not permit us to purchase health material to put into their hands; and the average teacher's salary here is so low that we do not feel justified in listing expensive literature. At the same time, our health problems in Mississippi are so acute and there is such a dearth of available health material that we feel it one of our most important tasks to review the publications in the field and make pertinent recommendations.
>
> Could you send us samples of any publications of your organization which our teachers

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

might find useful and within their means, and which they might procure from you at any time? They would be interested in pamphlets for their own use, for their pupils' information; in posters, and other simple, graphic material.

We shall appreciate a copy of your catalogue or bibliography and any material or suggestions you may give us.

Scholarships Available — Quick action will be necessary because May 15 is the latest date for filing applications for scholarship in health education at Massachusetts Institute of Technology.

Nurses will apply to National Organization for Public Health Nursing, teachers to National Tuberculosis Association, both at 50 W. 50th St., New York, N. Y.

From Republica de Colombia—It is exciting to run through a package of publications from the National Department of Health, Bogota, Colombia.

Salud y Sanidad is a popular health monthly with simple sketches and frequent cover pages in color, obviously adapted to local conditions. A striking page in red, blue, and black shows the progress of hookworm up through the human body from the foot, the point of *penetracion*. *Revista de Higiene* is the professional organ of the department.

Public Health Data for Parliament—A "Parliamentary Manual of Public Health" is being issued by Health League of Canada, 105 Bond St., Toronto, Ontario.

The *Manual* is a series of vertical file folders in each of which is fastened mimeographed material on the subject indicated on the tab of the folder. These are supplied to members of the Senate and the House of Commons, and may be sent to provincial legislators.

Each section is to provide easily accessible information on a health topic which may come up for discussion before Parliament.

The section on "Health—Diphtheria," 10 pages, presents: extent of the problem, seriousness of the problem, actual results of toxoid, health education needed, and what should be done.

As Seen by a Reporter—"A Reporter Visits the Springfield Clinic" is a part of an illustrated full-page feature article in *Springfield (Mass.) Sunday Union and Republican*. Jan. 24, 1937. Good to encourage visits to a clinic for treatment of syphilis.

"Leaves of Fig" is part of a *Boston Sunday Globe* column which discusses "the difference between awareness of sex and dirty-mindedness."

In *Bulletin*, Massachusetts Society for Social Hygiene, Little Bldg., Boston.

"Is Milk Cancer's Ally?"—From *Journal of American Medical Assn., March 13, 1937:*

In an editorial a few weeks ago the *Journal* condemned the editors of *Esquire* and *Coronet* for printing articles in the medical field without scientific background. Their ignorance in accepting and publishing such articles as they have published on the glands and on autotherapy was a sort of unfortunate, supercilious or silly ignorance. Now in the March issue of *Coronet* they lead off with an article entitled "Is Milk Cancer's Ally?" that betrays such a broad and comprehensive ignorance of milk and of cancer that one is stimulated to wonder as to the mental age of both editors and author of this publication. Here is the old argument that modern civilized man died of cancer but the American Indian did not die of cancer. The answer is of course that modern civilized man has a life expectancy of some 60 years at birth whereas the life expectancy of the Indians was about 20 years at birth. The Indians simply did not live long enough to die of cancer. More than 90 per cent of deaths from cancer occur in persons over 40 years of age. The Indians died of infectious diseases, exposure and other Indians. The same argument has been made with relation to the eating of

white bread versus the eating of whole grain. It might just as well be made with relation to automobiles. The Indians had no automobiles; hence the Indians did not die of cancer. Some preposterous arguments are made to show that cancer rates are higher in the states using the most milk. It may easily be shown that life expectancy is longer in the states using most milk because of better nourishment in those states. In some small type at the end of its article *Coronet* affirms its seriousness in presenting this article; this affirmation adds insult to injury. There is evidence that the article has already produced fear in the minds of some readers who do not stop to remember that neither the author of the article nor the magazine that prints it has the slightest scientific standing.

A Double Writing Contest—A writing contest for nurses, and one for laymen:

Topic for Laymen: What benefits can my community derive from the N.O.P.H.N.?

Topic for Public Health Nurses: What the N.O.P.H.N. means to me as a public health nurse.

Who is eligible to compete? Anyone except members of the present N.O.P.H.N. staff and Board of Directors!

Length of article: 1,000 words or less.

Date due: July 1, 1937.

Award: Life membership in the N.O.P.H.N. to be announced at the A.P.H.A. and N.O.P.H.N. meeting in October, 1937.

Send your articles to the National Organization for Public Health Nursing, 50 West 50th St., New York, N. Y.

Replace Misinformation and Superstition — Under "Coöperative Health Work," Dr. C. C. Applewhite of U. S. Public Health Service, says:

The success of public health work depends largely upon the character of the educational program executed. It is often necessary to replace misinformation and superstition with correct information. A successful education program does not merely impart correct information but implants or creates a desire among the people to make practical application of the information thus obtained. The old order in public health with its superstitions, false theories, shotgun quarantines, and fumigation must give way to the new public health which depends for its complete fruition upon scientific data, common sense, and an enlightened public opinion. By all the known methods of imparting information to the general public, effort should be made to teach the people the essential principles involved in disease prevention and health promotion.

In *Illinois Health Messenger*, Springfield, Ill., March 15, 1937.

Health Education South—Health education is represented in *Transactions of the Fifth Annual Meeting, Southern Branch, A.P.H.A.*, published by A.P.H.A. at $1.00 a copy.

Under "Poliomyelitis in Alabama During 1936":

Full and complete information concerning the epidemic and the incidence of cases was immediately made available to the general public and the people were informed daily as to the progress of the outbreak. The coöperation of the newspapers and press agencies proved invaluable in the dissemination of authoritative knowledge.

In "Screening as a Part of Malaria Control" is a quotation from National Malaria Committee report, including the following:

To revise educational material in order to bring it to the plane of all classes.

To promote public education on malaria.

"Activities of a County Health Department for One Year," includes a column on health education.

"Education of Public Health Nurses," by H. S. Mustard, M.D.

"Development of a Staff Education Program" (nursing) by J. L. Daniel.

Health Education in Normal Schools—Programs for student-teachers in normal schools and colleges are being conducted by New York State Department of Health.

Conducted with the coöperation of the Health and Physical Education Division of the State Education Department, these programs are intended to give future teachers a

thorough foundation in disease prevention and the rules of healthful living which can be passed on to boys and girls in their future classes, and to make health education basic to all education from the three R's to the advanced subjects taught in colleges and universities.

Demonstrations of three motion picture films on tuberculosis and accident prevention and a social hygiene talking slide film, with an explanatory talk by the department's representative, drew enthusiastic comment from many of the 550 members of the student body and faculty (at the first of these programs), most of whom had not known the extent of the department's facilities for assisting in health instruction . . .

A large supply of social hygiene material was requested for use by students as well as samples of other printed material for reference in the school library. The social hygiene literature is to be used in connection with a detailed study of syphilis, its control and prevention.

"Modern Health Advertising"—Under this heading *Nassau Medical News* (March, 1937) recalls in a page statement that back in 1929 that publication had urged advertising health information.

We must dress up our package, revise our publicity copy and employ more attractive advertising media. If we do this we need have no concern about the competition of the cultists, the faddists, or the uplifters. Ours is a legitimate product and if properly marketed will bring its own price.

The statement further comments on the recent coöperation of *Time, Life, Fortune,* and the March of Time news picture in spreading cancer information.

Published by Medical Society of County of Nassau, 1527 Franklin Ave., Mineola, N. Y.

"His Audience is His Orchestra"—"The public lecture, which has been such an important . . . factor in the intellectual life of America" is reviewed briefly in *Saturday Review of Literature,* 25 W. 45th St., New York, N. Y. March 3, 1934. *10 cents.*

The "lecture," or as we more often call it, the "talk," has a large place in the field of health education. This recognition of it as the chief means of adult teaching should encourage public health education to make much more of it—to develop the art of combining entertainment with instruction which has made the popular lecture platform an attraction to that part of the population which "is on the up grade intellectually."

Health Education Outlined: Part Two—This is a continuation of the article on adult or popular health education, by Raymond S. Patterson, which appears in the 1937 edition of *Social Work Year Book,* edited by Russell H. Kurtz (Russell Sage Foundation, 130 E. 22d St., New York, N. Y. $4.00).

Publicity Media. Newspapers have long been an avenue of valuable health publicity. The tactful health educator who has had the confidence of the editors of his community has been able to obtain space for articles having only a modicum of news value. Spokesmen for the publishers have claimed, with some justice, that newspapers have been more than generous in this regard. There has, however, been one notable exception to this coöperative attitude in the past of the press: most editors have balked at publishing articles about venereal diseases. This reticence was partially broken down by the publication in the Chicago *Tribune* in late 1935, and in the New York *Daily News* early in 1936, of extensively read series of articles on the venereal diseases, written by the papers' own staffs rather than by health officials. These somewhat lurid series have been followed by similar articles in other papers. *See* Social Hygiene.

Evaluation and Training. The greatest present-day needs in health education are (a) better means of determining the effectiveness of the methods used and (b) more skillful personnel. Ways of measuring the effect of educational projects have not as yet been perfected. Yards of news stories printed, thousands of books distributed, miles of film shown, mean little in terms of human behavior. Pioneering attempts have been made to measure the effect of education upon habits, attitudes, and knowledge, but they have been sporadic and none too convincing. It can

only be reported here that serious thought is being given by students of health education to this problem—a fact that is in itself worthy of note.

Health education needs a more highly trained and skillful personnel. As in all fields of human endeavor, the pioneers have had to accomplish results by the expensive method of trial and error. Much of the pioneering in health education is completed, and the continuing program calls for administration by persons trained in the psychology of human behavior and grounded in the pedagogical arts. Only recently have courses in health education been offered by leading universities. That such courses are sought after by students is a wholesome sign. Another evidence of the realization of the need for adequate training of health educators is that manuals of instruction in this subject are now in the process of preparation.

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Health Education in March, 1937, Journal—The items below have to do with health education.

"An Editor's 'Heart to Heart' Talk" (page 269) emphasizes again the possibility of saying as much or more in fewer words.

"The British Medical Journal" (pages 271–272) is for publishers, editors, and writers of health material.

In "Books and Reports" see "Wunder des Lebens" (page 295); "The Teaching of Physical Education" (page 296); "The Public Opinion Quarterly" (page 297); "A Health Education Workbook" (page 297); "Handbook of Health Education" (page 299).

"Conferences and Dates" (pages 310–311).

In the Supplement, "American Public Health Association Year Book," will be found lists of committees, including various Association committees on which the Section is represented; Public Health Education Section Council (page 13); and committees of the Section (page 27).

"Committee on American Museum of Hygiene" (pages 38–40).

"Methods in Health Education" (pages 147–148).

Numerous reports contain background material for those who speak or write, or supply information for use by others.

The Health Officer, March, 1937—*The Health Officer*, published by U. S. Public Health Service, Washington, D. C., contains much material not related to health education. We record

here only certain of the health education titles.

The Press Speaks on Social Hygiene (A three page article made up out of newspaper editorial comment on National Social Hygiene Day. An effective device) . . . The American Association of School Physicians . . . Methods in Health Education . . . News Briefs (includes several health education paragraphs).

"Alcohol and Health," a summary from authoritative sources, closes with this paragraph pointing to the significance of the article:

While the opinions and experimental evidence presented above cannot be said to give complete knowledge as to *all* the physiological effects of alcohol upon the human system, nevertheless, it is believed that they do sum up the important points about which the laity most frequently questions the public health worker.

"Methods in Health Education" is a broad review of ideas and activities which in the course of time may develop into "orderly arranged and established systems of teaching health." Considered are adult health education, child health education, value of health education. The author, John W. Knutson, D.D.S., even has a kind word for "propaganda" which was so severely treated in an earlier issue of *The Health Officer*.

Real Life Health Story Broadcast—Quick action in the use of current material is described in *Health News*, New York State Dept. of Health (April 5, 1937):

A true public health story as stirring as a tale from the pages of fiction was enacted on March 19 as a special feature of the Health Hunters Series of weekly health plays written, acted, and produced by members of the staff of the New York State Department of Health.

A dramatization of the real story of how a physician mustered the weapons of modern medical science in a successful fight against pneumonia in a remote part of the Catskills, the play was on the air only 60 hours after the events it recorded had taken place. In a series of scenes in which a blizzard-swept homestead in the mountains, a physician, and a young man stricken with Type V pneumonia play the leading rôles, it tells in as exact detail as possible how serum for that type of infection was brought within a few hours from New York City through the coöperation of the Willard Parker Hospital, state troopers, the New York City Police, railroad authorities, and others. It illustrates the results that may be expected in the treatment of pneumonia when the disease is diagnosed early and found to be of a type for which serum can be obtained and administered promptly.

This play will be reproduced by electrical transcription over a network of 18 radio stations throughout the state.

Hygeia, April, 1937—Articles in the April issue of *Hygeia*, 535 N. Dearborn St., Chicago, Ill. *25 cents.*

Tuberculosis—down but not out (with a graphic case history covering 5 generations) . . . Growing old gracefully . . . How to reduce . . . Poor circulation . . . Trustees of posterity (young people and tuberculosis) . . . Anemia . . . Tooth bleaching quackery . . . Nature's G-men: insects . . . Walking and cycling . . . Cattle's contribution to mankind . . . Curious stories about health . . . Soft diets that satisfy . . . A million forgotten children (speech cripples) . . . The doctor abroad—Holland . . . Kidney stones . . . Kiyoshi Shiga . . . More about heart disease . . . Health pictures . . . Radio announcements . . . New books on health . . . Questions and answers.

In "School and Health":

More on understanding the adolescent . . . Is the overweight child getting a square deal? . . . How the school nurse and teacher may work together . . . Is your playground safe?

Health Movies Catalogued Again—A classified list of 1175 non-theatrical films has been issued as "Educational Film Catalogue," published by H. W. Wilson Company, 960 University Ave., New York, N. Y. 134 pages. $2.00; with 4 quarterly supplements, $4.00.

The listed pictures were selected primarily for classroom use, but many

or most of them will be equally satisfactory for other audiences.

Health pictures are listed under such headings, as: hygiene; public health; children; infants; women; food; dietetics; cleanliness; sex education; public health; safety. There are headings for: bacteriology; diseases of respiratory system; tuberculosis; and so on.

The selections come largely from accepted sources; only one or two seem to be from advertisers, and any such have been approved by teachers. The listing is quite detailed, and should be found up to the well known standard of accuracy of the Wilson Company.

Be sure to send them information about new pictures, or pictures omitted from this first edition of the *Catalogue*.

Do Exhibits Pay at Meetings?—Do exhibits at annual meetings or other local gatherings repay the effort to get them in shape?

National health agencies receive requests for "an exhibit" to be shown at a meeting. Local workers may put in a lot of effort to assemble exhibits, or to construct them.

Here are some questions to be answered before deciding to have exhibits:

Will the audience arrive early enough to have time to look at the exhibits before the meeting?

Or, will people really stay after the meeting to look over the exhibits?

If it is an all day session will there be time between sessions, or will sessions run so close that the rush from one meeting to another will give no chance for leisurely examination of displays?

Then will the exhibits be off at one side, even in a different room, where they may be overlooked?

Why? And Why Not?—Why write or print "MEMORANDUM" at the top of a sheet on which a memorandum is written?

Or, why not write or print "LETTER" at the top of a letter, or "BOOK" on the title page of a book, or . . . ?

DATES AHEAD

In April issue mention was made of Mother's Day, National Hospital Day, Birthday of Florence Nightingale, and Birth of American Red Cross.

Timely in June will be tie-ups with commencement, weddings, camping, gardening, children's day in churches, end of school.

June 7: Founding of National Organization for Public Health Nursing
June 14: Flag Day
June 14: Shut-In Day
June 20: Fathers' Day. We seem to be far behind English workers in placing upon fathers a share of responsibility for care of the mother and young child.
June 21: Beginning of Summer.

Possible angles for handling some of the above dates will be found in *Almanac Notebook* and *News Almanac for Social Work*. Community Chests and Councils, 155 E. 44th St., New York, N. Y. *60 cents.*

FOR EDUCATION OR REFERENCE

Another specimen of the New Deal in government publications is "Homes for Workers," a 94 page pamphlet issued by PWA Housing Division. Superintendent of Documents, Washington, D. C. *15 cents.* Unusual and effective cover pages, with use of photographs, to be seen and not described. Text answers a series of 16 questions about low cost housing. The bibliography is helpfully annotated.

"Cook Pork and Its Products Thoroughly" is an anti-trichinosis leaflet. Bureau of Animal Industry, Washington, D. C. *Free.* You might ask also for copy of the mimeographed press release for your use.

"Courses in Public Health Nursing for Graduate Nurses." Brief descriptions of approved courses. National Organization for Public Health Nursing, 50 W. 50th St., New York, N. Y. Enclose *3 cents* postage.

"Health Syllabus" has been issued by Mississippi State Board of Health, Jackson, in response to the repeated calls made by school teachers for health material for classroom use. Its 80 pages include much useful material, but it would be less confusing to use if it had been organized in relation to a table of contents. It would be more helpful if it had less of the appearance of a scrapbook.

"Proceedings of Conference on Venereal Disease Control Work, Washington, D. C., Dec. 28–30, 1936." Superintendent of Documents, Washington, D. C. 160 pp. *15 cents.*

"Public Health Service Publications Issued January–June, 1936." U. S. Public Health Service, Washington, D. C. *Free.* About 50 titles are listed, most of them on technical topics.

"Questions and Answers about Community Chests and Councils of Social Agencies." Community Chests & Councils, 155 East 44th St., New York, N. Y. 27 pages. *25 cents.* "What people most want to know, as shown by letters and personal inquiries."

"Resources for the Care of the Tuberculous Available to Residents of Brooklyn." Brooklyn Tuberculosis and Health Assn., 293 Schermerhorn St., Brooklyn, N. Y. A mimeographed directory; 20 pages; heavy marbled cover sheets. Samples, *10 cents.*

"We Do Not Want Security," by F. S. Winslow, M.D. Reprint. Medical Society of State of New York, 2 E. 103d St., New York, N. Y. *Free.* The doctor must be insecure so that he will do his best for the patient.

"WPA and Negro Health" is a review of varied WPA activities. National Negro Health Week, U. S. Public Health Service, Washington, D. C. *Free.*

From American Medical Assn., 535 N. Dearborn St., Chicago, Ill.:

"Are You a Nervous Dyspeptic?" by E. A. Cameron. Reprint. *5 cents.*

"Contagious Disease Control" (in schools), by H. B. Wood and W. W. Bauer. Reprint. *10 cents.*

"The Rules of the Game," by J. F. Williams. Reprint in small size page, heavy paper, illustrated. *10 cents.* Rules: outdoor air, wholesome food in proper amounts, intelligent care of the body, rest and sleep, *thinking straight, exercise.*

From the Metropolitan Life Insurance Co., 1 Madison Ave., New York, N. Y. (free):

"Studies in Diabetes Mellitus," one on Etiology, and one on Heredity, both reprints by Joslin, Dublin, and Marks.

"Mortality from Cardiovascular-Renal Diseases" (including 13 charts shown at professional meetings).

MAGAZINE ARTICLES

More and better articles are likely to appear in magazines as a result of letters from readers.

"Allergic Addicts: But If You Don't Like Mother-in-Law You're Psychoallergic." The widening knowledge as to allergy. *Literary Digest,* 354 4th Ave., New York, N. Y. March 20, 1937. *10 cents.*

"The Health of the Nation," by E. V. Lape, *Atlantic Monthly,* 8 Arlington St., Boston, Mass. April, 1937. *40 cents.* Interpretation of American Foundation Studies in Government.

"Human Eye is Happiest Invention: Science Aids in Bringing Optics to Perfection Peak." *Literary Digest.* April 3, 1937. *10 cents.* 3 pages with illustrations.

Look, the picture monthly, May, 1937, gives two pages to mud, sand, and steam baths; a surgical picture (removal of a cataract); and a new teaching manikin of the head, showing

muscles and veins. 715 Locust St., Des Moines, Iowa. *10 cents.*

"So You're Going to Have a Baby," by H. Washburn (a whale of a different book from one health department pamphlet of prenatal information which opened with a page on high mortality of infants); "A Woman Surgeon," by Rosalie S. Morton, M.D., pioneer woman surgeon; "Idols and Invalids," by Dr. James Kemble (post-mortems of famous great via contemporary records). These and other books condensed in *Book Digest*, 350 E. 22d St., Chicago, Ill. March, 1937. *25 cents.*

"Turn on the Light," by J. D. Ratcliff. *Collier's.* Jan. 23, 1937. Ultraviolet ray in the hospital, the packing plant, and elsewhere.

NEW

Helps is a new, occasional bulletin issued by Maternity Center Assn., 1 E. 57th St., New York, N. Y. "For local groups interested in promoting better maternity in the United States." *Free.* The March 1, 1937, issue gives in considerable detail the methods of the Maternal Welfare Committee, Onondaga Medical Society, Syracuse, N. Y., and coöperating organizations, both professional and laymen.

REPORTS

The annual report of Massachusetts Society for Mental Hygiene, 3 Joy St., Boston, Mass., is one of small sized, readable looking reports. A full page diagram shows the activities of the Society. Another page is given to a list of past bequests and a form for new bequests.

The 1936 *Annual Report* of Commonwealth Fund, 41 E. 57th St., New York, N. Y. is notable for two "Sketches from the Field": "Obstetrics at the Crossroads," and "The Anglos Go Nursing." The first, a description of extension teaching in medical practice, the second, an account of visiting nursing in New Mexico. There is a table of contents.

The annual report of the Superintendent of Health, Providence, R. I., has a table of contents. Seemingly there are no reported health education activities.

The biennial report of Tennessee Dept. of Public Health (1933–1935) gives three pages to adult health education, and seven pages to the blue ribbon work among the school children. There is a table of contents.

"An Oasis of Health" is the cover title of the annual report of Judson Health Center, 237 Thompson St., New York, N. Y. The title on the upper part, with "Judson Health Center" near the foot of the attractive cover, make an effective combination. The full page photographs illustrate how it is no longer necessary to use smooth paper for half tones. There is a table of contents.

The customary attractive looking mimeographed report from Middletown, N. Y., has a page pie diagram of the budget dollar of Middletown showing 1½ cents for health. A boy and his dog sketched in a corner, the boy saying, "A penny an' a half don't buy a very big piece of pie, does it, Spot?"

"Three Years of Health Progress in New Haven" carries the Dept. of Health reports for 3 years. There is a table of contents which indicates a page devoted to public health education.

"For Better Health" is the annual report of the Minnesota Public Health Assn., 11 W. Summit Ave., St. Paul, Minn. It has 14 leaves (10½ by 8½ inches), 56 pages (5¼ by 8½ inches). The whole is thus folded twice to make a pamphlet 5¼ by 8½ inches. A four-page spread records 30 years of tuberculosis and Christmas seal history. For each year a paragraph, cut of that year's seal at the left, a red bar above

showing tuberculosis deaths per 100,000 population. Four pages are given to general health education and four pages to coöperation with other agencies (Minnesota State Medical Assn., Women's Auxiliary of State Medical, A.M.A., Minnesota 4-H Clubs, Minnesota Dept. of Health, Minnesota State Board of Control, Minnesota State Dept. of Education, Minnesota Education Assn., Minnesota Congress of Parents and Teachers, Minnesota Federation of Women's Clubs, Minnesota Editorial Assn., American Legion Auxiliary, Minnesota Safety Council, Minnesota State Conference of Social Work).

Here are the introductory paragraphs of the annual report presented at the annual meeting of the Illinois Society for Prevention of Blindness, Chicago:

In the lower right hand drawer of my desk at the Illinois Society, there is a folder marked "Annual Meeting," and into it, day by day throughout the year, are dropped scraps of information, reports, statistics and stories that reflect our work.

At the end of 365 busy, happy, exciting, frustrating or discouraging days, for any good organization experiences the whole gamut of them in a year, that folder looks like a last year's bird's nest.

On the 366th day it is my job to take that hopeless looking bunch of scraps and break it up and boil it down into something that will capture on paper, *not just figures* but our anxiety when we have raced in the teeth of a high March wind to an ophthalmia case 70 miles away, our exhaustion when we have treated 100 trachoma patients in a morning with the temperature at 104—our elation the day a sight-saving class is opened in a down-state community in early autumn.

REPORTING

"Annual Report: 1936." New York Diabetes Assn., 386 4th Ave., New York, N. Y. A picture of a new type of health agency as conducted in a large city.

A child's portrait in color, and "Let's See!" make up the cover of the 1936 annual report of the National Society for Prevention of Blindness, 50 W. 50th St., New York, N. Y. Maps of uniform style and size each show the geographical extent of a service rendered: field visits, film showings, etc.

Palama Settlement's Dental Clinic, Honolulu, Hawaii, reports for 1936: A photograph covers all of the two cover pages except a band of light brown which carries the institution name. Inside there are 4 full page photographs in a total of 28 pages.

Los Angeles County, Pasadena, and Racine, Wis., issue extensive mimeographed reports. Los Angeles, 85 pages; Pasadena, 125 pages; Racine, 45 pages. All well mimeographed, Pasadena on both sides of the sheet; Pasadena, single spaced, and Racine, double; all with printed cover sheets; all with full indexes, Pasadena with table of contents also. Our impression is that Pasadena is a bit the best, as to looking both impressive and readable.

BOOKS AND REPORTS

Annual Report of the Surgeon General of the Public Health Service of the United States, Fiscal Year Ending June 30, 1936—*Washington, D. C.*, 158 pp.

The 65th annual report of the Public Health Service presents activities during the 138th year of its existence. This year marked the retirement of Surgeon General Hugh S. Cumming after 42 years of service as an officer, 16 of those years having been devoted to the important duties of Surgeon General.

For the first time in the history of the Service, a national health program was made possible, under the public health provisions of the Social Security Act. Grants-in-aid to the States and Territories strengthened existing organizations and helped to develop important new services. Of fundamental importance was the adoption of qualification standards to govern the eligibility of persons for employment in the several phases of health service. Means were provided for the technical training of doctors, nurses, engineers, and others who were to be employed in carrying out the work planned under the expanding program. These activities have been discussed in an editorial.

Studies on nutrition showed that canned mackerel is a good source of the pellagra-preventive vitamin and that certain liver extracts may be of considerable value in the treatment of the disease. Four reports on studies of physical growth and development in children were completed. The principal finding was that, so far as size and growth of children are concerned, the depression did not seriously affect any considerable number of American children. Four other studies relating to fatal accidents of childhood revealed as the most frequent causes of these fatalities of children under 15 years of age: automobile accidents, burns, drowning, falls, poisonings, and mechanical suffocation. Among the extensive developments in industrial hygiene were studies of industrial diseases. One of these analyses included 529 employees of the fur-cutting industry among whom 43 cases of chronic mercurial poisoning were found. One of the significant features of the disease was the extent to which it involved disorders of the nervous system.

A marked decrease in the incidence of Rocky Mountain spotted fever was observed during the 1936 season. A large quantity of vaccine was produced and furnished to the Civilian Conservation Corps in 48 camps located in the more dangerous endemic areas of the West and Northwest, and to 10 other federal agencies for administration to field employees of the Forest Service and Resettlement Administration.

Field studies indicated that sylvatic plague probably entered Montana from Idaho in 1933 or 1934. *Pulex irritans*, a known vector of plague, is reported prevalent on coyotes, occurs frequently on dogs, may infest prairie dogs, and occurs on deer in western Oregon.

Public health administration studies involved 3 main lines: administrative problems in public health organization, influence of health education measures on the knowledge and practices of the

people, and certain features of illness and medical service. An analysis of the experience of county health departments from the standpoints of survival and growth was made for 811 counties covering the period 1908–1934.

Other features of this report cover investigations of laboratory and clinical problems, milk sanitation, sewage treatment, water purification, and the health inventory. The inventory embraces a study of disabling illness, physical impairments, and medical care among 865,000 families in 90 cities and 23 rural counties throughout the United States, a communicable disease survey to determine the incidence and fatality of 13 diseases, chiefly among persons less than 15 years of age, a study of the amount of time lost due to illness among industrial workers, the relation of illness to occupation, a census of hospitals, a survey of hospital outpatient departments, and a survey of public health facilities.

IRA V. HISCOCK

Get It Right! A Cyclopedia of Correct English Usage—*By John B. Opdycke. New York: Funk & Wagnalls,* 1936. 673 pp. Price, $3.50.

The review of this book was undertaken with much pleasurable anticipation. The reviewer has derived a great deal of both pleasure and profit from studying it, but soon realized that he had undertaken a task for which very few are properly equipped. A number of years of editing have brought him into contact with almost all of the problems discussed as well as the mistakes and blunders pointed out. He has used it in everyday work for some time past with a constantly increasing appreciation of its completeness and value. It contains so much in such a comparatively small volume that a detailed criticism is not possible, though one would like to mention especially certain of the tables and lists, such as that of foreign words and phrases which should be italicized and those not, that pointing out the correct prepositions after verbs, etc.

We wish all of the contributors to this *Journal* could have this book and note statements as that found on page 468: "But too frequently revision in galleys and even in page proofs has to be made because copy has been carelessly and inaccurately prepared and is thus not clear to the type-setter."

The reviewer does not have the nerve to criticise this book. He confesses, however, to being old-fashioned enough to dislike some of the recommendations, for example, the omission of the period after such abbreviations as Dr., St., Mr., Mrs., etc., a fashion which the author hopes will be increasingly adopted.

The chapter on punctuation is most interesting. The author is inclined to reduce punctuation to a minimum, using it only where it is necessary for clearness of expression. We remember the old example, "The quality of mercy says, Shakespeare is not strained."

On the reviewer's desk are a number of the best known style books and a half dozen dictionaries. Most of these can be put more or less in the discard by consulting the book before us. We hope that writers and would-be writers will buy and use it.

The make-up and printing are excellent.

MAZÝCK P. RAVENEL

So You're Going to a Psychiatrist!—*By Elizabeth I. Adamson, M.D. New York: Crowell,* 1936. 263 pp. Price, $2.50.

This is one of an increasing number of books which, written by a psychiatrist or not, aim to spread more widely among people the scope and implications of psychiatry, its contribution to human personality, and its capacity to

help people who are caught in difficult psychiatric situations. This book is written by a psychiatrist with sufficient training and knowledge to meet the requirements which the critical attitude of the reviewer may set. The contents therefore must be viewed from the knowledge of psychiatry and also from the point of view of the reader. Is the psychiatry in this book accurate? Are its statements warranted by knowledge, experience and observation? Are the conclusions justified? Do the interpretations of personality problems and the mechanisms to explain them fit into the framework of what is really known? These are some of the many questions which present themselves.

The chapter headings are obviously designed to catch the eye. Some of them are picturesque, a bit startling—"Politics of the Mind," "The Baby's Five Year Program," "Design for Immaturity," "Running from Ghosts," etc. These are conscious efforts to impress the reader that psychiatry is just one of the ways people do things or talk about things. The obvious purpose of such descriptive headings is to render the reader more comfortable and at ease. The mind, the reader may say, is not such a mysterious thing if it can be compared to politics. If the Soviet has a five year plan, why not a baby? This is a kind of subterfuge to influence the reader in thinking of the vexatious problems of consciousness as something easily compared to many of the ordinary experiences of life. This certainly is not true, and no amount of clever descriptive phrases can hide from the intelligent reader, whether trained layman or not, that comparatively few of the mechanisms of the human mind are clearly or definitely understood. It is presumed that the writer knows quite well that her chapter headings are misleading; that many of them imply an essential inaccuracy and depart widely from the truth as far as it is known. On the other hand, the chapters are better than their headings. There is a great deal of common sense in the writing, and when the author can forget the implications of her dramatic chapter headings she seems to write more readily, less self consciously, and expresses more neatly the psychiatric ways of thinking.

Chapter II, "From Intuition to Intelligence," is well done. It defines psychiatry clearly, points out its limitations, and says that physicians as a whole are apt to be almost as ignorant of the implications of modern psychiatry as the patients who are in need of it. "Politics of the Mind" is not very good. The quarrel between the ego, super-ego, and the id is too much in line with and too much influenced by the term "politics." Freud's effort to explain conflicts by suggesting the eternal war between divisions of consciousness scarcely warrants so flat-footed a statement as mental compartments as contained in this chapter. "Running from Ghosts," touches upon the nature of conflict, which the author implies lies at the base of a great deal of mental difficulty. The influence of parents in increasing the child's unwillingness to face his conflict is properly emphasized.

Many of the mechanisms associated with Freudian psychology are described. Here again there is much rigid writing and dogmatic statement which would make the reader believe that there is agreement among psychiatrists and psychologists as to the meaning, implications, and presence in the mind of these mechanisms. A great many of these mechanisms so glibly described and definitions so pat are matters of considerable disagreement. For example, the author states that the most complete unconscious flight from life's problems is that of insanity. This she must know cannot be true, because

in many psychoses the escape is very incomplete and life problems infiltrate constantly into the awareness of the individual.

The statement that suicide is a retaliation and not a flight certainly needs a much more extended interpretation. Such expressions show that the writer, no matter with what intentions, has been influenced a little bit too much by the necessity of carrying in the chapters themselves the dramatic implications of her headings.

Dr. Adamson describes "queer people," especially neurotics, also "dangerous children," especially criminal people with unhealthy characters, and makes a very definite statement that the criminal character dates back to childhood and is due to unwise handling by emotional immature parents. This is true of some criminals, but not of all. It is an opportune time to present some objection to the idea that everything that happens in a person's life that seems to be out of the way, that turns out to be antisocial, that is bad, immoral, and destructive is always due to parental stupidity, bad training, and bad childhood environment.

The author describes some of the methods and instrumentations which are in the hands of the psychiatrist to aid or help or cure his patients. This is one of the best chapters in the book because it is written objectively and with a good deal of common sense, and apparently not written down to the reader or influenced by a picturesque title.

There is a great deal of emphasis on the terms conflict and adjustment. These two mechanisms are capable of a great deal of elastic interpretation, and the example of the well adjusted lives makes one rather skeptical of the value of adjustment and somewhat in favor of the existence of conflict. Adjustment does not mean complacency, and conflict does not always mean unhappiness or produce neurotic manifestations, and it is not fair to lead the reader to believe that the existence of neurotic symptoms implies always conflicts, or may be thought of as the result of them.

There is a rhythm and swing in the life history of man or woman which seems to indicate that there are various times and various episodes in which conflicts are of great value. Certainly there are many abnormal results from conflicts which are not understood and which are not managed, which is perhaps a better term than that of adjustment. These things as well as many other personality experiences mentioned by the author must be thought of as part and parcel of living, and certainly neither conflict nor adjustment spells the entire problem of the living capacity of the individual and the capacity to reach average levels of achievement within the limits of the individual and no one else.

On the whole, this book is far better than most that belong to this group. The reviewer is impressed by the author's personal acquaintance and experience with the various problems presented by psychiatric situations. One wishes that Dr. Adamson had seen and known, or at least written about, cases not merely in hospitals, wards, and institutions, but outside of them. The author is a little bit too professional and a little bit too much the psychiatrist. The reviewer wonders whether she forgets that the psychiatrist is after all a physician and the further he departs in his psychiatric activities from the common understanding and common experiences of illness not belonging essentially to the psychoses or neuroses the more he fails to get hold of the unity of the problem which even a definite psychosis or neurosis presents. This unity comes about when the psychiatric illnesses are intimtely associated

with the problem of medicine as a whole.

In spite of the many objections, this book is a good one and worth reading. It contains much of value and the chances are that readers will remember more that seems to be true and forget many of the things that are uncertain and doubtful.

SIDNEY I. SCHWAB

Adventures in Living Series—*5 vol. (ill.), Glossary. By Thomas D. Wood, M.D., Anette M. Phelan, Ph.D., Marion O. Lerrigo, Ph.D., Nina B. Lamkin, A.M., Thurman B. Rice, M.D. New York: Nelson,* 1936. *Now We Are Growing,* 218 pp., $.60; *Many Ways of Living,* 209 pp., $.60; *Keeping Fit,* 237 pp., $.72; *Blazing the Trail,* 248 pp., $.80: *How We Live,* 328 pp., $.80.

From an array of authors like these we would expect a series of books that treat the subject of health in a comprehensive manner for elementary and junior high school students.

From the series the ambitious teacher will gather facts and suggestions for supplementing her own health teaching. How appealing the first volume of the series, *Now We Are Growing,* would be to young children for their own reading is questionable.

Organization of material and subjects is a weak point, especially in the volume, *Now We Are Growing.* In this book there is a chapter entitled, "Learning About Grains," but interest is lost in it by the too lengthy introduction to the subject. Secondly, too many concepts are included in this single chapter. For instance, after considering grain as a food, the subject of grain as an ingredient in beer and alcohol is discussed, but with no special relation to the non-nutritious effect of those beverages. The authors also make the statement, "bread is one of the cheapest and best kinds of food," which opens controversy among nutritionists.

Evidences of occasional carelessness in editing are found, as in the story of a shipwreck. We find these unrelated sentences, "With a special kind of gun, a rope was shot to the Antinoe. The men tried sixteen times before they succeeded." Succeeded in doing what?

What is the purpose of pointing out lessons to primary children, or even those of the 4th grade, of the disastrous results of an accident caused by a drunken driver? Young children have no control over such a situation. Becoming intoxicated is too remote from their own personal experiences. Why teach safety by such a story? Why not impress upon children what they, themselves, can do to avoid automobile accidents?

Where vitamins are mentioned in this book, *Now We Are Growing,* the reader presupposes that lessons on vitamins have been developed previously, otherwise the juvenile reader is inducted suddenly into a subject which is foreign to him. True, vitamins are defined in the glossary, but it is not until we open the volume, *Keeping Fit,* that vitamins are explained and their story satisfactorily told.

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ties at the conclusion of each chapter carry ingenious suggestions for vitalizing health teaching.

ANNA B. TOWSE

Hygiene or the Gospel of Health —*By Neville M. Goodman, M.D. (3rd ed.) London: St. John Ambulance Association,* 1935. 195 pp. Price, $1.00.

The title of this book explains what it is. Having reached the third edition, one is assured that the little volume has found a useful place. The present edition is excellent as far as it goes and can be recommended for the uses for which it is designed.

While dated 1935, it has reached our desk only within the last week. The printing and binding are good, and each chapter has a list of questions which will aid in carrying out the instruction of students. MAZŸCK P. RAVENEL

BOOKS RECEIVED

MALARIA IN EUROPE An Ecological Study. By L. W. Hackett. New York: Oxford, 1937. 336 pp. Price, $3.75.

GUIDING YOUR LIFE. By Josephine A. Jackson. New York: Appleton, 1937. 352 pp. Price, $2.50.

THE PSYCHOLOGY OF EATING. By Lewis R. Wolberg. New York: McBride, 1936. 321 pp. Price, $3.00.

A REVIEW OF NURSING. By Helen F. Hansen. 2d ed. Philadelphia: Saunders, 1937. 692 pp. Price, $3.00.

SOCIAL WORK YEAR BOOK, 1937. By Russell H. Kurtz. New York: Russell Sage, 1937. 709 pp. Price, $4.00.

THE MIND OF MAN. The Story of Man's Conquest of Mental Illness. By Walter Bromberg. New York: Harper, 1937. 323 pp. Price, $3.50.

OUR CHILDREN IN A CHANGING WORLD. An Outline of Practical Guidance. By Erwin Wexberg with Henry E. Fritsch. New York: Macmillan, 1937. 232 pp. Price $2.00.

MODERN PRINCIPLES OF VENTILATION AND HEATING. By T. Bedford. London: Lewis, 1937. 85 pp. $1.75.

VITAMINS. By Leslie J. Harris. 2d ed. New York: Macmillan, 1937. 242 pp. Price, $3.00.

MEMORANDA OF TOXICOLOGY. By Max Trumper. 3d ed. Philadelphia: Blakiston, 1937. 304 pp. Price, $2.00.

BIOLOGICAL TIME. By P. Lecomte du Nouy. New York: Macmillan, 1937. 180 pp. Price, $2.00.

SALARIES AND PROFESSIONAL QUALIFICATIONS OF SOCIAL WORKERS IN CHICAGO, 1935. By Merrill F. Krughoff. Chicago: University of Chicago Press, 1937. 89 pp. Price, $.50.

THE LICENSING OF BOARDING HOMES, MATERNITY HOMES, AND CHILD WELFARE AGENCIES. By Gladys Genevra Fraser. Chicago: University of Chicago Press, 1937. 107 pp. Price, $.75.

OCCUPATIONAL HAZARDS AND THE PAINTER. By Adolph B. Gersh. Published by New York District Council No. 9, 1937. 99 pp.

WHO GAVE THE WORLD SYPHILIS? The Haitian Myth. By Richmond C. Holcomb. New York: Froben Press, 1937. 189 pp. Price, $3.00.

THE LITTLE THINGS IN LIFE. The Vitamins, Hormones, and Other Minute Essentials for Health. By Barnett Sure. New York: Appleton-Century, 1937. 340 pp. Price, $2.50.

CANCER AND DIET. By Frederick L. Hoffman, LL.D. 767 pp. Price, $5.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Vegetarianism, Nature's Panacea—Excessive eating of meat causes cancer, diabetes, and pernicious anemia. Abstinence from flesh foods will prevent maternal mortality. Soya beans and nuts are the vegetarian's answer to all protein problems, so says this British sanitarian in a presidential address.

DRUIT, A. E. Health. Public Health (Great Britain) 50, 6 (Mar.), 1937.

About Child Guidance in Health—A general discussion of the need of planning and leadership in the health education of youngsters with useful illustrations drawn from experiences far and wide.

HISCOCK, I. V. For the Enrichment of Childhood. J. Health & Phys. Ed. 8, 2:74 (Feb.), 1937.

Goitrous Regions Resurveyed—Iodized salt for general use in goitrous regions is found in this study to be the most effective prophylactic measure.

KIMBALL, O. P. Prevention of Goiter in Michigan and Ohio. J.A.M.A. 108, 11:860 (Mar. 13), 1937.

Cause of Caries—Dental caries is not a question of nutrition, but of oral hygiene. If food is soft, sticky, or sweet, the saliva does not flow to wash the teeth, so the food remains, ferments, and is swallowed at the next meal to produce dyspepsia, duodenal ulcers, colitis, or worse. Babies are born with perfect teeth even though mothers are ill nourished. Perfect teeth are just as easily attacked as those of less perfect structure. These are only a few of the stimulating statements culled from this discussion. The Duchess in "Alice in Wonderland" exercised her believing faculties each day. Here is your chance.

MOORE, I. The Prevention of Dental Caries. J. State Med. 45, 3:165 (Mar.), 1937.

School Health Services—Questions are raised about the value of the school health service as ordinarily conducted, with some discussion for improvements. Though outside the province of many sanitarians, the paper will prove interesting; in fact, most of the discussions in this journal should somehow or other be made available for health workers.

PALMER, G. T. Organizing for Better School Health Programs. J. School Health. 7, 3:37 (Mar.), 1937.

To Examine or Not To?—Typhoid carriers in great cities may be so few that food handler examinations are not justified, but in this study of a smaller southwestern city 13 carriers were discovered among 4,800 examined, and that number is large enough to make the procedure well worth while.

SCOTT, J. R. Typhoid Carriers Among Seven Thousand Food Handlers. Canad. Pub. Health J. 28, 3:120 (Mar.), 1937.

Controlling Gonorrhea and Syphilis—Six of the excellent papers read at the Surgeon General's conference on venereal disease control work are combined in this symposium. Unless the syphilis patient is induced by a humane approach to give unswerving allegiance to the treatment, the most elaborate scheme and equipment will be reduced to nothing. Diagnostic procedures are

susceptible of improvement. Adequate treatment of gonorrhea comes only with an interested clinic staff. Providing treatment and diagnostic facilities are still the keystone of the state preventive program despite all our big plans for education and case finding. These are a few of the points that remain in the memory long after the reading.

STOKES, J. H. Clinical Problems in Syphilis Control Today.

HAZEN, H. H. The Serodiagnosis of Syphilis.

PELOUZE, P. S. Modern Clinical Management of Gonorrhea.

BROWN, E. G. The Venereal Disease Control Program in Kansas.

GODFREY, E. S., JR. The New York State Program for Syphilis Control.

CLARKE, C. W. A Typical City Program for Combatting Syphilis and Gonorrhea. J.A.M.A. 108, 10:780 (Mar. 6), 1937.

For the Mote in Our American Eye—This British writer points out that rheumatic heart disease will be conquered only when the country acts boldly. Care of crippled children is an essential act of humanity, but preventing conditions which cause spread of rheumatic fever requires more statesmanship. Health authorities cannot wait idly for the bacteriologist and the biochemist to produce preventives, but must take part in the program for social improvement. There may be an idea or two in this for us.

WALLACE, H. L. The Problem of the Rheumatic Child. J. State Med., 45, 3:138 (Mar.), 1937.

Preventing Measles Deaths—Restating the need for keeping children under 3 years and children in poor condition out of contact with measles cases by preventing such children from playing with older children during measles epidemics.

WILLIAMS, H. The Prevention of Deaths from Measles. South. M. J. 30, 3:304 (Mar.), 1937.

Miscellaneous Information about Several Infections—Ten papers, in full or abstract, from the symposium on communicable diseases at the Harvard Tercentenary Session, include a great deal of interest to epidemiologists, about typhus, influenza, gonorrhea, yellow fever, pneumonia, and some of the parasites.

ZINSSER, H., *et al.* Recent Advances in the Study of Typhus Fever, etc. New Eng. J. Med. 216, 11:449 (Mar. 18), 1937.

ASSOCIATION NEWS

SIXTY-SIXTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION

New York, N. Y.
October 5-8, 1937
HEADQUARTERS: HOTEL PENNSYLVANIA

LOCAL COMMITTEE OFFICERS

DR. JOHN L. RICE, General Chairman of the Local Committee for the Sixty-sixth Annual Meeting announces the appointment of the officers and sub-committee chairmen assisting him:

Edward S. Godfrey, Jr., M.D., Vice-Chairman
Donald B. Armstrong, M.D., Vice-Chairman
James A. Tobey, Dr.P.H., Secretary
George T. Palmer, D.P.H., Treasurer

Chairmen

Louis I. Dublin, Ph.D.	Finance Committee
Haven Emerson, M.D.	Reception Committee
Frank Kiernan	Publicity and Radio Committee
Bernard S. Coleman	Meeting Rooms Committee
Jessamine S. Whitney	Registration Committee
Arthur P. Miller	Inspection Trips Committee
Homer N. Calver	Entertainment Committee
Mrs. Louis I. Dublin	Ladies Entertainment Committee
Clarence L. Scamman, M.D.	Membership and Attendance Committee
John Oberwager, M.D.	Transportation Committee

The first meeting of sub-committee chairmen was held in the Commissioner's office on Friday, April 16, to discuss the organization, plan and conduct of a meeting which is expected to be the most largely attended and the most important in many years.

Four thousand delegates are expected, representing members of the American Public Health Association, the National Organization for Public Health Nursing, the American Association of School Physicians, and other allied groups which habitually meet with the Association.

The plans of the Local Committee will be announced in future issues of the JOURNAL.

HEALTH CONSERVATION CONTESTS FOR 1936

THE Chamber of Commerce of the United States in coöperation with the American Public Health Association announces the following winners for the 1936 (the 8th Annual) City Health Conservation Contest and for the 1936 (the 3rd Annual) Rural Health Conservation Contest:

CITY CONTEST

GROUP I—Cities of over 500,000 population. The winner is Milwaukee, Wis. An award for meritorious achievement is given to Pittsburgh, Pa.

GROUP II—Cities of between 250,000 and 500,000 population. The winner is Dallas, Tex. An award for meritorious achievement is given to Oakland, Calif.

GROUP III—Cities of between 100,000 and 250,000 population. The winner is New Haven, Conn. Awards for meritorious achievement are given to Syracuse, N. Y.; Grand Rapids, Mich.; Springfield, Mass.; Reading, Pa.; Honolulu, Hawaii; Erie, Pa.; Hartford, Conn.; and Tacoma, Wash.

GROUP IV—Cities of between 50,000 and 100,000 population. The winning city is Pasadena, Calif. Awards for meritorious achievement are given to Brookline, Mass.; Waterbury, Conn.; Sacramento, Calif.; Evanston, Ill.; Binghamton, N. Y.; Racine, Wis.; and Saginaw, Mich.

GROUP V—Cities of between 20,000 and 50,000 population. The winner is Greenwich, Conn. Awards for meritorious achievement are given to Auburn, N. Y.; Watertown, N. Y.; Montclair, N. J.; and Plainfield, N. J.

GROUP VI—Cities of under 20,000 population. The winner is Middletown, N. Y. Awards for meritorious achievement are given to Hibbing, Minn.; and Blackwell, Okla.

SPECIAL AWARDS (for cities having twice previously won the Contest and having during the past year maintained their previous high standards of health achievement) are given to Baltimore, Md.; Hackensack, N. J.; Newark, N. J.; Palo Alto, Calif.; and Schenectady, N. Y.

RURAL CONTEST

NORTHEASTERN DIVISION—The winning county is Columbia County, N. Y. Awards for meritorious achievement are given to Cattaraugus County, N. Y.; Saginaw County, Mich.; Ottawa County, Mich.; Cortland County, N. Y.; and Richland County, Ohio.

EASTERN DIVISION—The winner is Davidson County, Tenn. Awards for meritorious achievement are given to Fayette County, Ky.; Gibson County, Tenn.; Madison County, Ky.; Wicomico County, Md.; Montgomery County, Md.; and Scott County, Ky.

SOUTHEASTERN DIVISION—The winner is Pike County, Miss. Awards for meritorious achievement go to Lauderdale County, Miss.; Bibb County, Ga.; Charleston County, S. C.; and Coahoma County, Miss.

NORTH CENTRAL DIVISION—The winner is Shawnee County, Kans. Award for meritorious achievement is given to Woodbury County, Iowa.

SOUTH CENTRAL DIVISION—The winner is Dallas County, Tex. (No other awards given in this division.)

WESTERN DIVISION—The winner is Los Angeles County, Calif. Awards for meritorious achievement go to San Bernardino County, Calif.; and Spokane County, Wash.

SPECIAL AWARD (for any county having twice previously won the Contest and having during the past year maintained its previous high standards of health achievement) goes to El Paso County, Tex.

THE 1936 AWARDS OF FREE PUBLIC HEALTH SURVEYS

AT its meeting on April 12, the Grading Committee of the City and Rural Health Conservation Contests, conducted by the Chamber of Commerce of the United States and the American Public Health Association, considered the large number of applications for these surveys (19 for the City and 23 for the Rural), and awarded the City Survey to Oakland, Calif., and the Rural Survey to Caddo Parish (Shreveport), La. The surveys will be made in the near future by members of the American Public Health Association staff.

These awards are the most valuable prizes offered in connection with the Contests, all participating units are eligible for consideration except those winning first awards. The bases of the awards are the useful purpose to be served by the survey, and readiness of all groups in the community to cooperate in it and to work to give effect to practical recommendations for improvement.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Fred W. Bodge, 91 Robbins Rd., Watertown, Mass., Health Officer

Benjamin F. Brooks, M.D., P. O. Box 56, La Conner, Wash., County Health Officer

John L. Cox, M.D., Campton, Ky., Wolfe County Health Officer

Leonard H. Denny, M.D., New Market Bldg., Portsmouth, Va., Director of Public Welfare

George A. Gray, M.D., Sweetwater, Tex., Director, Nolan County Health Unit

Clarence L. Guyton, M.D., Walterboro, S. C., Colleton County Health Officer

Edward J. Helgren, Santa Rosa, Calif., City Health Officer

J. R. Kingston, M.D., 1111 Lake Blvd., Bemidji, Minn., Director, Rural District 1

J. E. Lester, M.D., 205 Washington Ave., Marietta, Ga., Cobb County Commissioner of Health

Addie M. Lyon, M.D., 201 W. Main, Louisa, Ky., Lawrence County Health Director

James B. Parramore, M.D., Box 89, Key West, Fla., Director, Monroe County Health Unit

Jose Quintini, M.D., 615 N. Wolfe St., Baltimore, Md., Studying for Certificate of Public Health at present; Health Officer in Venezuela

Roy E. Schirmer, M.D., Blytheville, Ark., Director, Mississippi County Health Unit

Sue H. Thompson, M.D., West Branch, Mich., Director, District Health Unit 2

George M. Uhl, M.D., 98 Northampton Ave., Berkeley, Calif., Trainee in Public Health; After May 1, Chief, Bureau of County Health Work, State Board of Health

Charles E. Watkins, M.D., Fayetteville, W. Va., Public Health Director, Fayette County

Raymond E. Wehr, M.D., Paintsville, Ky., Director, Johnson County Health Dept.

John B. West, M.D., M.P.H., 108 W. 136 St., New York, N. Y., District Health Officer, New York City Dept. of Health

Laurence M. Wiig, M.D., Waiuku, Maui, T.H., Health Officer of Maui

Rush L. Wright, M.D., Poteau, Okla., Leflore County Supt. of Health

Laboratory Section

Jose Basnuevo, M.D., Concordia 20, Habana, Cuba, Chief, Laboratory of Parasitology, National University

Roy C. Costello, M.D., Little Bldg., East Liverpool, O., Health Commissioner and Pathologist, East Liverpool City Hospital

Edgar L. Geibel, City Bldg., Butler, Pa., Health Officer and Laboratory Director

Julia L. Goldschmidt, 2334 E. 70 St., Chicago, Ill., Junior Bacteriologist, State Dept. of Public Health

Anthony F. Halpin, 787 Lake St., Newark, N. J., Assistant Chemist, Newark Water Dept.

Lloyd G. Herman, Dept. of Pensions and National Health, Ottawa, Ont., Canada, Assistant Bacteriologist, Laboratory of Hygiene

Lance C. Hill, Emporia, Kans., City Bacteriologist

Dwight M. Kuhns, M.D., 221 Augur, Fort Leavenworth, Kans., Chief, 7th Corps Area Laboratory

Vital Statistics Section

Lucien L. Benepe, State Board of Health, Helena, Mont., Deputy State Registrar

Public Health Engineering Section

Thomas A. Cantrell, P. O. Box 1005, Athens, Ga., District Engineer, State Dept. of Public Health

Henry B. Crowell, Jr., P. O. Box 406, Dawson, Ga., Sanitary Engineer, Terrell County Board of Health

Thomas G. English, 5607 Howe St., Pittsburgh, Pa., Chief Plumbing Inspector, City of Pittsburgh

Curtiss M. Evarts, Jr., 816 Oregon Bldg., Portland, Ore., Acting State Sanitary Engineer

Harry G. Hanson, 305 Fourth Ave. N., Fargo, N. D., District Supervisor, Community Sanitation

Ralph S. Howard, Jr., Box 732, Chapel Hill, N. C., District Engineer, Georgia Dept. of Health

Clarence W. Klassen, State House, Springfield, Ill., Chief Sanitary Engineer, State Dept. of Public Health

Sylvan C. Martin, State Dept. of Public Health, Springfield, Ill., Sanitary Engineer

Everett R. Miller, 24½ E. Main St., Chillicothe, O., Sanitarian, Board of Health

Walter S. Stanley, Rt 7, Box 186, San Antonio, Tex., Chief Chemist and Director of Sanitation

Alfred E. Williamson, Box 456, Tifton, Ga., Sanitary Engineer, Tift County Health Dept.

Industrial Hygiene Section

Gay V. Carroll, C.E., 801 E. 23 St., Austin, Tex., Engineer, State Dept. of Health

David H. Paley, M.D., 955 Walton Ave., New York, N. Y.

Henry H. Rubin, M.D., 310 S. Michigan Ave., Chicago, Ill., Industrial Hygienist

B. H. Vollertsen, M.D., E. I. duPont de Nemours & Co., Niagara Falls, N. Y., Medical Supervisor

W. B. Wardlow, 1312 Elton Lane, Austin, Tex., Engineer, Division of Industrial Hygiene, State Dept. of Health

Food and Nutrition Section

Sarah H. V. Dugan, State Dept. of Health, Louisville. Ky., Director, Bureau of Foods, Drugs, and Hotels

George H. Vogel, 38 Davis Ave., Poughkeepsie, N. Y., Inspector of Foods, New York City Dept. of Health

Child Hygiene Section

May Borquist, M.D., Board of Health, Honolulu, T. H., Associate Director, Bureau of Maternal and Infant Hygiene

Ethel C. Dunham, M.D., Children's Bureau, U. S. Dept. of Labor, Washington, D. C., Director, Division of Research in Child Development

Public Health Education Section

Mary H. Harkin, 174 Chatham St., New Haven, Conn., Student

Katharine J. Hawley, M.P.H., 493 Edgewood Ave., New Haven, Conn., Graduate Student

David Resnick, 420 Madison Ave., New York, N. Y., Director of Publicity, National Society for Prevention of Blindness, American Social Hygiene Assn., Henry Street Visiting Nurse Service

Mary V. Vogt, M.D., Newburg Rd., Louisville, Ky.

Public Health Nursing Section

Bess Alverson, Potlatch, Idaho, Health Nurse, Latah County

Hortense H. Cikovsky, 5 Pine St., Alexandria, Va., Public Health Nursing Consultant, Children's Bureau

Agnes T. Clancy, Board of Health, Honolulu, T. H., Acting Assistant Director, Bureau of Public Health Nursing

E. Maxine Fereday, R.N., P. O. Box 1249, Pocatello, Idaho, Nurse, State Health Dept.

Ruth J. Heffner, 1208 First Ave., Middletown, O., Staff Nurse, Middletown Civic Assn.

Mary J. Leake, R.N., Whittle Springs Hotel, Knoxville, Tenn., Staff Nurse, Knox County Health Dept.

Adele R. Payne, P. O. Box 112, Dunlap, Tenn., Nurse, State Dept. of Public Health

Margaret C. Van Ackeren, R.N., 1027 Des Moines St., Des Moines, Ia., Assistant Director, Public Health Nursing, State Dept. of Health

Wilmae E. Wirsing, R.N., Missouri Tuberculosis Assn., St. Louis, Mo., Field Nurse

Epidemiology Section

Carlos A. Alvarado, M.D., Belgrano 666, Buenos Aires, Arg., S. A., General Secretary, National Hygiene Dept.

Ilie Ardelean, M.D., 55 Shattuck, Boston, Mass., Student; Assistant, Institute of Hygiene, Cluj, Roumania

Clement F. Batelli, M.D., City Hall, New Haven, Conn., Director, Bureau of Tuberculosis, City Health Dept.

Alberto P. Leon, M.D., Veracruz 56, Mexico, D. F., Mex., General Supervisor and Epidemiologist, Dept. of Public Health

Ernest Newman, M.D., 130 Sturges St. W., N. Brighton, S. I., N. Y., Medical Inspector, New York City Dept. of Health

Russell E. Pleune, M.D., 30 Fuller Rd., Watertown, Mass., Epidemiologist, Michigan Dept. of Health

Theodore Rosenthal, M.D., 115 W. 86 St., New York, N. Y., Assistant Director, Bureau of Social Hygiene, New York City Dept. of Health

Dr. Sergio Vindas, 718 N. Broadway, Baltimore, Md., Student; Chief Health Officer, Sanitary Unit of Turrialba, Costa Rica, C. A.

Unaffiliated

Wallace Byrd, M.D., Camp Morrie S. P. 17, Ironwood, Mich.

James S. Cullyford, M.D., 512 Delaware St., S.E., Minneapolis, Minn., Student

Sidney I. Franklin, M.D., 1030 Trinity Ave., Bronx, N. Y., Student

J. H. Hendry, M.D., Indian Hospital, Tacoma, Wash.

Irving Marcus, 4819–14th Ave., Brooklyn, N. Y., Student

Bruce H. Pollock, M.D., South Side, W. Va., Medical Supervisor, State Health Dept.; at present studying for Certificate of Public Health

Mack D. Shelhorse, State Office Bldg., Richmond, Va., Administrative Assistant, State Dept. of Health

Henry F. R. Watts, M.D., 6 Monadnock St., Boston, Mass., Health Commissioner

DECEASED FELLOWS AND MEMBERS

C. Duncan, M.D., Concord, N. H., Elected Member 1919, Fellow 1922

Willard P. Greene, M.D., Minneapolis, Minn., Elected Member 1928, Fellow 1931

R. L. Laybourn, Topeka, Kans., Elected Member 1917, Fellow 1923

Roy W. Pryer, Portland, Mich, Elected Member 1916, Fellow 1922

Joel A. Sperry, Ph.D., New Haven, Conn., Elected Member 1914, Fellow 1922

John Thames, M.D., Charleston, W. Va., Elected Member 1919, Fellow 1922

J. W. Becker, St. Louis, Mo., Elected Member 1928

Squire R. Boggess, M.D., Lawrenceburg, Ky., Elected Member 1932

Marion E. Brown, M.D., New Orleans, La., Elected Member 1936

Ernest G. Carscallen, Crawfordsville, Ind., Elected Member 1935

Brigadier-General Matthew A. DeLaney, Carlisle, Pa., Elected Member 1928

John E. Dowd, New York, N. Y., Elected Member 1931

Edward J. Farrell, M.D., Berwyn, Ill., Elected Member 1934

Thomas F. Harris, Belmont, Mass., Elected Member 1919

Arthur Hieronymus, M.D., Alameda, Calif., Elected Member 1919

John D. Hunter, M.D., Crowley, La., Elected Member 1935

George C. D. Lenth, Chicago, Ill., Elected Member 1928

Dr. Benjamin O. McCleary, Baltimore, Md., Elected Member 1920

Harold E. Miner, M.D., Holyoke, Mass., Elected Member 1936

Thomas F. O'Brien, M.D., Hartford, Conn., Elected Member 1935

Joseph F. Phelan, Boston, Mass., Elected Member 1919

Edward C. Rushmore, M.D., Tuxedo Park, N. Y., Elected Member 1920

Dr. William B. Wherry, Cincinnati, O., Elected Member 1914

Simon F. Curran, M.D., Dorchester Centre, Mass., Elected Member 1919

John H. Gregory, Baltimore, Md., Elected Member 1911

Malvina M. Grieves, R.N., Pittsburgh, Pa., Elected Member 1934

Ferdinand McKeige, Brooklyn, N. Y., Elected Member 1929

Robert H. Murray, C.E., Regina, Sask., Canada, Elected Member 1932

C. R. Skinner, M.D., Hudson, N. Y., Elected Member 1934

Professor Percy G. Stiles, Boston, Mass., Elected Member 1919

SOVIET TOUR

MEMBERS of the Association who are contemplating a trip abroad this summer will be interested in knowing of the Public Health Tour in the Soviet Union under the direction of John A. Kingsbury. The party, composed of health officials, physicians, and social workers will sail from New York on the S.S. Georgic on July 10, and visit London, Copenhagen, Helsingfors, Leningrad, Moscow, Kharkov, Rostov, Baku, Tiflis, Batum, Sochi, Yalta, Sevastopol, Odessa, Kiev, Paris, returning to New York on September 11.

Mr. Kingsbury, it will be remembered, surveyed the field in 1932 and thereafter collaborated in the writing of the book *Red Medicine*.

This tour is being arranged in consultation with the Commissariat of Public Health of the Soviet Union and public health committees are arranging programs of interest to the group at stops outside of the Soviet Union.

Further information, and details about prices, etc., may be obtained from the *Open Road,* 8 West 40th Street, New York.

NEWS FROM THE FIELD

SUMMER SCHOOL COURSES IN PUBLIC HEALTH

While the following list does not show all universities and technical schools offering summer courses in public health, it represents those who have replied to a questionnaire sent out by the American Public Health Association.

American National Red Cross

Courses in Teacher Training for Home Hygiene Instructors:

University of California, Los Angeles, Calif.—June 26–August 6
Colorado State College, Fort Collins, Colo.—July 12–August 20
University of Minnesota, Minneapolis, Minn.—June 14–July 24
Peabody College, Nashville, Tenn.—June 8–July 15
Pennsylvania State College, State College, Pa.—June 29–August 6
Syracuse University, Syracuse, N. Y.—July 5–August 13

University of California, Berkeley, Calif.

June 28–August 6

General Bacteriology
Child Development
Health Problems in the Secondary Schools
Administration of the School Health Program
Supervision in Public Health Nursing
Principles and Practice of Public Health Nursing
Introduction to Educational Psychology
Care of Dependents
Community Organization
Elements of Economics
General Psychology
Elementary Epidemiology *
Elementary Public Health *

* These two courses are offered in the Intersession, May 18–June 26

University of California at Los Angeles, Los Angeles, Calif.

Elementary Bacteriology
Elements of Economics
Growth and Development of the Child
Adolescence
Mental Hygiene
Administration of the School Health Program
Speech Development and Correction of Speech Disorders
Speech Correction Clinic
Principles of Teaching as Applied to Home Hygiene Courses
Methods in Teaching Home Hygiene Courses with Practice Teaching
Essentials of Nutrition
Family Relationships
Elementary Human Physiology
General Psychology
Abnormal Psychology
Elementary Epidemiology
Preventive Medicine
Principles and Practice of Public Health Nursing
Social Case Work
General Zoölogy
Endocrinology

The Catholic University of America, Washington, D. C.

June 25–August 7

Child Study
Nursing Education
Public Health Nursing
Social Work
Sociology

Columbia University

DeLamar Institute of Public Health, College of Physicians and Surgeons, 630 West 168th Street, New York, N. Y.

June 14–July 2

School Health Supervision—Medical Inspection, Mental Hygiene, and Physical Education

(These courses will not be given unless ten candidates have signified their intention to register before May 1)

Teachers College, Columbia University, New York, N. Y.

July 12–August 20

Organization of Health Education in Public Schools
Child Hygiene
Health Education
Health and Physical Education
Health Care of Children
Home and Community Hygiene
Nutrition and Health
Personal and General Hygiene
Public Health Nursing
Public Health Administration
Safety Education Materials and Methods
School Nursing
Social Hygiene
Education of the Handicapped, including courses in
- Organization, Methods, Materials, Practice Teaching, and Clinical Work
- Survey of Ear, Orthopedic, Cardiac, and Certain Tuberculous Conditions, and of Certain Types of Malnutrition
- Education of the Blind and Partially Seeing
- Education of the Deaf and Hard of Hearing
- Education of the Crippled and Other Motor Handicapped
- Education of the Mentally Handicapped
- Education of the Socially Handicapped
- Speech Correction

Cornell University, Ithaca, N. Y.

July 5–August 13

Health Education:
- The School Health Program
- Mental and Physical Health Problems of the School Child

Physical Education:
- Gymnastics
- Leadership in Community Recreation Program
- Swimming (Men and Women)
- Tennis (Men and Women)
- Recreational Folk Dancing

University of Denver, Denver, Colo.

June 14–August 20

Health of School Children
Courses in All Collegiate Subjects
Speech Conference

Duke University, Durham, N. C.

June 10–July 21

Materials and Methods in Health Education
Mental Hygiene of the School Child
Personal and School Hygiene

The University of Hawaii, Honolulu, Hawaii

June 28–August 6

Conservation of Sight
Physical and Health Education in the Elementary School
Physical and Health Education in the Secondary School
Principles of Health Education and School Hygiene
Principles of Public Health

University of Illinois, Urbana, Ill.

June 21–August 14

Home Economics:
- Nutrition
- Dietetics
- Organization and Management of the Home
- The Child and His Development

Physical Education for Men:
- Physical Education
- Adapted Activities
- Program in Extracurricular Sports
- Problems in Physical Education
- Recreational Sports

Physical Education for Women:
- Physical Education
- Community Recreation
- Physical Education Program for the High School
- Administration of a Health and Physical Education Program
- Principles of Body Movement

State University of Iowa, Iowa City, Iowa

June 14–August 6

Hygiene
Nursing
Nutrition
Physical Education

Massachusetts Institute of Technology, Cambridge, Mass.

June 14–July 23

Bacteriology
Public Health Bacteriological Methods
Middle of September
Food Technology Seminar

Michigan State College, East Lansing, Mich.

June 21–July 30

General Bacteriology
Medical Biology Courses
Pathological Bacteriology
Personal Hygiene
Sanitary Science

University of Michigan, Ann Arbor, Mich.

June 28–August 7

Child Hygiene
Principles of Public Health Nursing
Administration and Organization of Public Health Nursing
Methods and Materials in Health Education

University of Minnesota, Minneapolis, Minn.

First Term June 14–July 24; Second Term July 24–August 28

Public Health

The National Society for the Prevention of Blindness, New York, N. Y., announces the following courses of training for teachers and supervisors of sight-saving classes:

Western Reserve University, Cleveland, Ohio
June 21–July 30. Elementary Course.
June 28–July 31. Advanced Course.
Teachers College, Columbia University, New York, N. Y.
July 12–August 20. Elementary Course.
July 12–August 20. Advanced Course: The Activity Program in Sight-Saving Classes.
Wayne University, Detroit, Mich.
June 29–August 6. Elementary Course.

The University of New Mexico, Albuquerque, N. M.

June 8–July 31

Methods and Materials in Health Education
First Aid

New York University—School of Education, Washington Square, New York, N. Y.

July 5–August 13

Courses in Public Health Nursing:
Principles of Public Health Nursing
Organization and Administration in Public Health Nursing
Organization of School Nursing
The Teaching Activities of the Public Health Nurse
Industrial Nursing
The Teaching of Home Nursing and Home Hygiene
Applied Nutrition for Health Supervisors
Child Hygiene
Community Hygiene
Advanced First-Aid — Materials and Methods
Physical Inspection for Nurses and Social Workers
Social Case Work in the Schools
A Survey of Physical Defects in Children
The use of Physical Agents in Orthopedics
Organization and Administration in the Care of the Physically Handicapped
Practicum in the Rehabilitation of Orthopedic Cases
Observation and Practice in Public Health Nursing
Field Work in Family Case Work
Public Dental Education

New York University, New York, N. Y.

July 6–October 8

Course of six weeks, preparing for reconstruction work with the physically handicapped.

Summer course, to be given at Lake Sebago Camp, Sloatsburg, N. Y., under

the auspices of New York University, Summer Session of the School of Education.

Information can be secured from Dr. Walter J. Craig, Director of the Division of Orthopedics, New York State Department of Health, and from New York University, New York, N. Y.

Northwestern University, Evanston, Ill.
June 21–August 14

Personal Hygiene for Men and Women
Principles of Social Case Work
Supervised Field Work (Social Service)
Medical Lectures for Social Workers (Given in Chicago)
Psychiatry for Social Workers (Given in Chicago)
Problems in Organization and Administration of Physical Education
Preventive and Corrective Physical Education

Rutgers University, New Brunswick, N. J.
June 28–August 7

Public Health

Smith College—School for Social Work, Northampton, Mass.
July 8–Sept. 2

Health and Disease
Child Development and Hygiene
Social Aspects of Medicine

Springfield College, Springfield, Mass.
June 28–July 31

General Education
Social Science
Character Education
Health and Physical Education:
Symposium on Health Education
Experimental Physiology
Corrective and Therapeutic Gymnastics

Stanford University, Stanford University, Calif.
June 17–August 28

Physical Education and Hygiene

Syracuse University, Syracuse, N. Y.
July 5–August 13

Public Health Nursing
Public Health Administration
Case Studies in Public Health Nursing
Methods of Teaching Home Hygiene and Child Care
Mental Hygiene
Nutrition
Hygiene Methods for Elementary and Secondary Class Room Teachers
Psychology of Childhood
Psychology of the Adolescent

Temple University, Philadelphia, Pa. Teachers College—Department of Physical and Health Education
June–July

Administration of Health Education

University of Virginia, University, Va.
June 21–July 31 (First Term)
August 2–September 4 (Second Term)

Education:
Sex Character Education
Hygiene and Sanitation
Mental Hygiene
Nursing Education:
Curriculum in Schools of Nursing
Supervision in Hospitals and Schools of Nursing
Institute for Doctors' Helpers

Wagner College, Staten Island, N. Y.
July 4–July 12

Bacteriology

Washington University, St. Louis, Mo.
June 8–July 30

Education
Psychology
Public Health Nursing
Public Speaking
Sociology and Social Work

University of Washington, Seattle, Wash.
June 16–July 23 (First Term)
July 26–August 26 (Second Term)

Diagnostic and Remedial Work in Education
Behavior as an Expression of Health
Nutrition
Bacteriology
Organization, Administration, and Techniques in Special Fields of Public Health Nursing
Public Health Administration and Epidemiology
Rural Public Health Nursing
Health Service in Schools
Posture Teaching Program
Principles of Health Education
Methods and Materials in Health Education

Wayne University, Detroit, Mich.

June 21–August 14

School Nursing
Psychology
Sociology

University of West Virginia, Morgantown, W. Va.

June 9–August 26

History of Physical Education
Playground and Community Recreation
Public School Health
Problems in Physical Education
Tests in Health and Physical Education

Western Reserve University—School of Applied Social Sciences, Cleveland, Ohio

June 21–July 30

Summer Program in Public Health Nursing:
Principles of Public Health Nursing
Principles of Orthopsychiatry
Method of Social Case Work
Public Health Nursing in Syphilis and Gonorrhea Control

University of Wisconsin, Madison, Wis.

June 28–August 6

Bacteriology
Effects of Physical Activity on the Body (Physiology of Exercise)
First Aid to the Injured
Health Education in Schools
Human Anatomy
Physical Examinations and Therapeutics
Play, Recreation and Leisure Time Problems
Physical Therapy
Recent Advances in Applied Physiology
School Health and Hygiene
Tests and Measurements in Physical Education

NATIONAL RECREATION CONGRESS

THE Twenty-second National Recreation Congress will meet in Atlantic City, May 17–21, 1937, at the Ambassador Hotel. This Congress willl bring together approximately a thousand laymen and executives from all parts of the United States—leaders engaged in varied types of recreational service, but deeply concerned with questions of mutual interest.

NEW ENGLAND HEALTH EDUCATION ASSOCIATION

THE New England Health Education Association will hold its 12th Annual Meeting in the Massachusetts Institute of Technology, Pratt Building of Naval Architecture, Cambridge, Mass., June 4–5.

THEOBALD SMITH MEMORIAL LABORATORY

AT the Albany Medical College, Union University, the Theobald Smith Memorial Laboratory was dedicated on March 19. Dr. Charles R. Stockard of Cornell University School of Medicine spoke on "The Spirit of the Laboratory." The new building houses the departments of Physiology, of Pharmacology, and of Experimental Surgery.

ROCKEFELLER FOUNDATION

IN 1936 the Rockefeller Foundation gave away $11,300,000, coöperating with 130 agencies scattered from Scandinavia to Java, according to the annual report of its president, Raymond B. Fosdick, which will be issued

shortly. . . . The International Health Division of the foundation conducted work in 30 states and in 41 foreign countries. This cost $2,100,000, one-fourth of which went toward public health education.

PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY

AT the Annual Meeting of the Public Health Association of New York City, April 13, the following officers were elected:

President—Ralph Muckenfuss, M.D.†
First Vice-President—John L. Rice, M.D.*
Second Vice-President—Hazel Corbin, R.N.*
Secretary-Treasurer—Frank Kiernan.*

PERSONALS

DR. JAMES G. TOWNSEND,* Director of Health in the Office of Indian Affairs, Washington, has been elected President of the District of Columbia Tuberculosis Association, succeeding Dr. William Charles White.

JESSE FEIRING WILLIAMS, M.D.,* of Teachers College, was among those to whom honorary scrolls were awarded by the Columbia Graduate School Alumni Association in recognition of "outstanding contributions to the human race" at a recent convocation.

DR. THORVALD MADSEN, Honorary Fellow of the A.P.H.A., who is Director of the State Serum Institute of Denmark, gave a series of lectures at the School of Medicine of Vanderbilt University, Nashville, Tennessee, during March and April, on the Control of Venereal Diseases in Denmark, on the Mechanism of Bacterial Infection, on the Epidemiology of Tuberculosis, on the Influence of Seasons on Infection and on Whooping Cough.

KENNETH F. MAXCY, M.D., DR.P.H.,* Professor and head of the Department of Preventive Medicine and Public Health at the University of Minnesota, Minneapolis, has been appointed Professor of Bacteriology at the School of Hygiene and Public Health, Johns Hopkins University, Baltimore.

G. J. HUCKER, PH.D.,* Chief in Research in Bacteriology at the New York State Agricultural Experiment Station, Geneva, has been granted 6 months' leave of absence to accept an invitation from the Government of New Zealand to spend 4 months in the Dominion, conferring with bacteriologists, experts in dairy problems and veterinarians on a research program on the Detection and Control of Mastitis and Septic Sore Throat.

DR. ALLAN J. MCLAUGHLIN,* formerly Medical Director in the U. S. Public Health Service, has joined the faculty of the Division of Hygiene and Public Health at the University of Michigan. Dr. McLaughlin will offer the course in Community Health Problems and Epidemiology.

JACOB ROSENBLUTH, M.D.,† Chief Diagnostician of the New York City Health Department since 1928, has been appointed District Health Officer.

THOMAS PARRAN, M.D.,* Surgeon General, U. S. Public Health Service, President of the A.P.H.A., received the honorary degree of Doctor of Pharmacy from the Philadelphia College of Pharmacy and Science at the 116th celebration of its Founder's Day ceremony, February 23.

WILLIAM J. FRENCH, M.D.,* Health Officer of Anne Arundel County, has been made an honorary member of the Howard County Medical Society of Maryland.

* Fellow A.P.H.A.
† Member A.P.H.A.

DR. ARCHIBALD S. DEAN,* District State Health Officer for the New York State Department of Health, Buffalo, N. Y., has been appointed District State Health Director, effective April 1. In his new post, Dr. Dean's work will extend over a wider territory than the 7 counties in west New York now part of his district, but his headquarters will remain in Buffalo.

THOMAS F. ABERCROMBIE, M.D.,† Director of the Georgia State Department of Health, was awarded the honorary degree of Doctor of Science during the centennial celebration of Emory University, December 12.

ALTON R. PERRY, M.D.,† of Natchez, Miss., formerly Health Officer of Adams County, has been appointed to take charge of the new health unit established in Jones County, Miss., January 1. Dr. Charles R. Gillespie, formerly of Greenwood, Miss., Acting Director of Leflore County, will succeed Dr. Perry in Adams County.

DR. SANFORD P. LEHMAN,† formerly of Wooster, Ohio, has been appointed Health Officer of Olympia and of Thurston County, Wash., to succeed Dr. Beverly D. Holland who has been appointed to the Army Medical Corps.

DON C. PETERSON, M.D.,* formerly of the Texas State Health Department, has been appointed Director of the Williamson County Health Department, Franklin, Tenn., effective March 1.

WILLIAM C. BUNTIN, M.D.,† of Staten Island, has been appointed Health Officer of the Borough of Richmond, New York City.

DR. HARRY V. GIBSON,† Fairchild, Wis., has been appointed Health Officer of a new unit organized in Eau Claire County, one of three demonstration units set up with state and federal funds.

DR. EDWARD R. KRUMBIEGEL,† Milwaukee, Wis., has been appointed head of the division of contagious diseases in the Milwaukee Health Department, succeeding the late Dr. Robert E. Hickey.

DR. LEE FOSHAY has been appointed Professor of Bacteriology and head of the department in the College of Medicine of the University of Cincinnati, succeeding the late Dr. William B. Wherry.

WALTER MYERS SMITH, M.D.,† of Morrilton, Ark., has resigned as Director of the Field Experience Center, to accept a similar position with the Division of Maternal and Child Welfare of the Arkansas State Board of Health. William P. Scarlett, M.D., of Morrilton, Director of the Conway County Health Unit, will succeed Dr. Smith, and Dr. Scarlett will be succeeded by John M. Smith, M.D.,† formerly of Russelville.

DR. JACQUES P. GRAY,* Assistant Director of Public Health in the City and County of San Francisco, has resigned to become Director of the Kirby Memorial Health Center, Wilkes-Barre, Pa., and Health Officer of Wilkes-Barre. Dr. Gray is a native of Iowa and has had wide experience in public health administration on the West Coast.

DR. M. C. HANSON,† Mansfield, Ohio, has been appointed Director of Health of the City of Toledo.

DEATHS

SHELDON L. HOWARD, Registrar and Chief of the Division of Vital Statistics of the State Department of Public Health of Illinois, died on March 9, 1937. Mr. Howard had been Registrar of Vital Statistics almost since the present Vital Statistics law became effective and the system

* Fellow A.P.H.A.
† Member A.P.H.A.

in vogue, and the accomplishments along statistical lines in the State Department of Public Health were due mainly to his efforts. He has been a member of the A.P.H.A. since 1926, and a Fellow since 1931. Dr. Robert H. Woodruff, who has served under Mr. Howard for several years as Medical Assistant Registrar has been appointed to serve as Acting Registrar until such time as the position is permanently filled.

CONFERENCES AND DATES

American Public Health Association—66th Annual Meeting. Hotel Pennsylvania, New York, N. Y. October 5–8.

American Association for the Advancement of Science. Denver, Colo. June 21–26.

American Association of Industrial Physicians and Surgeons. Hotel Statler, Detroit, Mich. May 3–7.

American Association of School Physicians. Annual Meeting in conjunction with Annual Meeting of the American Public Health Association. Hotel Pennsylvania, New York, N. Y. October 5–8.

American Association of the History of Medicine. Atlantic City, N. J. May 3–5.

American Association of Mental Deficiency—61st Annual Convention. Atlantic City, N. J. May 5–8.

American College of Surgeons. Chicago, Ill. October 25–29.

American Committee on Maternal Welfare, Inc. Luncheon meeting. Hotel Dennis, Atlantic City, N. J. June 9.

American Dental Association. Atlantic City, N. J. July, 1937.

American Heart Association. Atlantic City, N. J. June 7–11.

American Home Economics Association—30th Annual Meeting. Muehlebach Hotel, Kansas City, Mo. June 21–25.

American Hospital Association. Atlantic City, N. J. September 13–17.

American Medical Association—Eighty-eighth Annual Session. Atlantic City, N. J. June 7–11.

American Physical Education Association. New York, N. Y. April 21–24.

American Radium Society. Atlantic City, N. J. June 7–8.

American Society for Clinical Investigation. Atlantic City, N. J. May 3.

American Society of Heating and Ventilating Engineers—Semi-Annual Meeting, 1937. New Ocean House, Swampscott, Mass. June 24–26.

American Society of Medical Technologists. Atlantic City, N.J. June 7-9.

American Therapeutic Society. Atlantic City, N. J. June 4–5.

Canadian Public Health Association. Chateau Laurier, Ottawa, Ont. June 17–19.

Canadian Tuberculosis Association. Chateau Laurier, Ottawa, Ont. June 17–19.

Central Atlantic States Association of Dairy, Food and Drug Officials. Rochester, N. Y. May 12–13.

Connecticut Public Health Association. May, 1937.

Health Officers and Public Health Nurses Annual Conference, under the auspices of the New York State Department of Health. Grand Union Hotel, Saratoga Springs, N. Y. June 22–24.

International Association of Milk Dealers. Dallas, Tex. Oct. 21–23.

Massachusetts Safety Conference. Hotel Statler, Boston, Mass. April 5–6.

Public health demands special knowledge of its workers which is not always acquired in the usual professional channels. The April, 1937, issue of THE TRAINED NURSE AND HOSPITAL REVIEW contains three unexpected "lifts" in this direction:

Accomplishments in a Prison Hospital

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Michigan Association of Industrial Physicians and Surgeons. Hotel Statler, Detroit, Mich. May 3–7.

Mid-west Conference on Occupational Disease. Hotel Statler, Detroit, Mich. May 3–7.

Minnesota State Medical Association. St. Paul, Minn. May 3–5. (Congress of Allied Professions, May 3.)

National Association of Insecticide and Disinfectant Manufacturers, Inc. Chicago, Ill. June, 1937.

National Conference of Social Work. Indianapolis, Ind. May 23–29.

National Congress of Parents and Teachers—41st Annual Convention. John Marshall Hotel, Richmond, Va. May 3–7.

National Recreation Congress. Atlantic City, N. J. May 17–21.

National Tuberculosis Association. Milwaukee, Wis. May 31–June 3.

National Tuberculosis Association—Los Angeles Institute for the Training of Tuberculosis Workers. Los Angeles, Calif. June 15–30.

New England Health Education Association. Annual Meeting. Massachusetts Institute of Technology, Cambridge, Mass. June 4–5.

New York Diabetes Association, New York Academy of Medicine. New York, N. Y. May 11.

New York State Association of Public Health Laboratories—21st Annual Meeting, Binghamton, N. Y. May 10.

New York State and Local Committees on Tuberculosis and Public Health, State Charities Aid Association, Hotel Roosevelt, New York, N. Y. May 11–13.

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The New National Health Series—Edited by The National Health Council	.35
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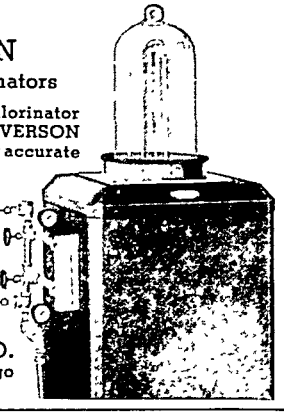
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Physician, M.D., Medico Chirurgical, Philadelphia, 4 years' Army Medical Corps, 10 years' full time county health officer, 5 years' field experience in syphilis control; desires position as venereal disease control officer in a state or municipality which is seriously interested in the control of syphilis. A-284

Physician, M.D. University of Maryland School of Medicine, and C.P.H. Johns Hopkins University, nine years' experience as county and school health officer; desires position as director of a county or district with headquarters in a city. A-265

Physician, M.D. Loyola University, post graduate studies in bacteriology and medical sciences at University of Chicago, will consider position as a state or municipal health officer. Experience covers direction of health department laboratories and research and assistant commissioner of health of a large city. A-295

Young man, S.B. in biology and public health, Massachusetts Institute of Technology, postgraduate courses in health education, business administration and economics, desires executive position with official or non-official agency. Has been health officer of a city of 10,000 population for 9 years. A-296

Physician, M.D. Ohio State University, C.P.H. Harvard School of Public Health, seeks position as health officer or epidemiologist. A-297

LABORATORY

Bacteriologist, B.S. Cornell University, desires position doing research or routine bacteriology. Experienced in bacteriology, hematology, serology, clinical pathology, etc. Recently completed one year's special research on streptococci in air pollution. L-299

Young man, A.B. in Chemistry, Phillips University; M.S. in Public Health Laboratory work, University of Michigan, June, 1937, desires position in state or city health department laboratory. L-304

PUBLIC HEALTH ENGINEER

Public Health Engineer, graduate of Massachusetts Institute of Technology, with B.S. in Public Health Engineering, desires position. Has served as assistant county and state sanitary engineer, and as assistant areal supervisor of occupational morbidity and mortality study, Office of Industrial Hygiene and Sanitation, U.S.P.H.S. L-283

CHILD HYGIENE

Pediatrician, graduate Columbia College of Physicians and Surgeons 1912, with excellent background of practical and administrative experience in large city health department, will consider position of teaching or administration in child hygiene. A-288

Young woman, M.D. Yale 1930, Dr.P.H. Yale, excellent background teaching and child hygiene administration, state and local, will consider an exceptional opportunity, preferably in the East. C-289

Physician, M.D. University of Iowa, with experience as state director of child hygiene and with a background of health education, has been full time city health officer and teacher in Class A medical school, is available for position paying $5,000 per annum. A-290

Woman physician, M.D. Creighton Medical School, with extensive experience in maternal, infant and child hygiene and special interest in crippled children's service, desires positon. Prefers Western or Central states. C-301

MISCELLANEOUS

Physician, M.D. Western Reserve University, M.P.H. Harvard, extensive experience in pediatrics and school medical service, also background of county health administration and teaching in Class A medical school, now employed, will consider expanded opportunity in teaching or research. M-302

Young woman, M.S.P.H. University of Michigan, experienced in laboratory research and health education, is available for research or investigative work. M-303

Experienced research microbiologist, Ph.D. Western Reserve University, will consider position in public health laboratory service or university teaching. M-291

Graduate, University of Michigan, M.S., experienced in Public Health Service health inventory, will consider administrative offer in a health department. M-292

Physician, M.D. Northwestern, Dr.P.H. Johns Hopkins, broad experience in laboratory, teaching and epidemiological fields, now engaged in Eastern department of public health, will consider part time assignments during first half of 1937. M-293

Young woman, Ph.D. Columbia University, splendid background of experience in health education, will consider position in Eastern states in university or promotional agency. M-294

Physician, M.D. Northwestern University, Ph.D. Johns Hopkins University, Dr.P.H. Yale University, is eager to secure general public health work, health center administration, infant welfare or epidemiology position. A-300

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III. VITAMIN A

The importance and multiple functions of vitamin A in human nutrition are widely dealt with in clinical literature. Xerophthalmia resulting from severe vitamin A deficiency is rare in this country, yet the etiology of many pathogenic conditions, namely, night-blindness, urinary calculi, lesions of the nervous system, impairment of epithelial tissue and subnormal growth, has been linked with chronic avitaminosis A (1).

Minimum human requirements for vitamin A are influenced by such variables as size of the individual and efficiency of absorption. The minimum daily requirement of infants has been estimated at 1500 International units, based upon the vitamin A content of milk. The need for the vitamin is not supplied by 1200 International units, while 2000 International units appear to be sufficient (2).

Although the minimum requirement of the adult has been estimated to be as low as 500 International units, the optimum level for both older children and adults is probably between 3000 and 5000 International units per day (3). The League of Nations Technical Commission recommends over 5000 International units of vitamin A for the pregnant and for the lactating woman (4).

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(1) a. 1935. J. Am. Med. Assn. 105, 1608
b. 1936. Ibid. 106, 996
(2) 1934-35. Am. Pub. Health Assn. Year Book, Page 70.
(3) a. 1934. J. Am. Diet. Assn. 10, 296
b. 1936. Indian J. Med. Research 23, 741
(4) 1936. League of Nations Report on Physiological Bases of Nutrition, League of Nations Publication Department, Geneva.
(5) 1933. Chemistry of Food and Nutrition. H. C. Sherman. 4th Ed. Page 364. MacMillan. New York.
(6) a. 1931. J. Nutrition 4, 267
b. 1933. J. Am. Diet. Assn. 9, 295
c. 1936. J. Nutrition 11, 383
(7) a. 1935. J. Home Econ. 27, 658
b. 1933. Georgia Expt. Sta. Bull. No. 177
c. 1936. J. Am. Diet. Assn. 12, 231

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And *The Nation's Health*

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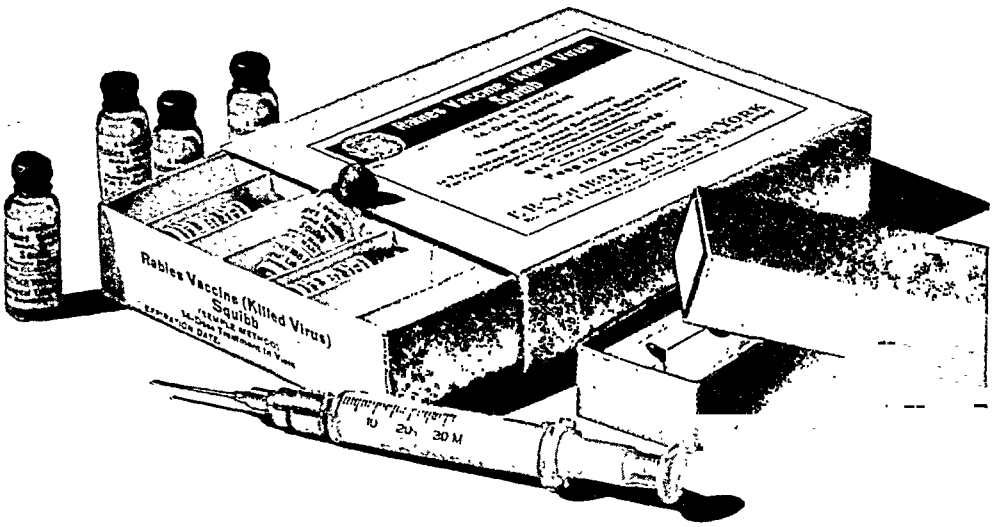
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Volume 27 — June, 1937 — Number 6

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Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Readers' Guide in your library.

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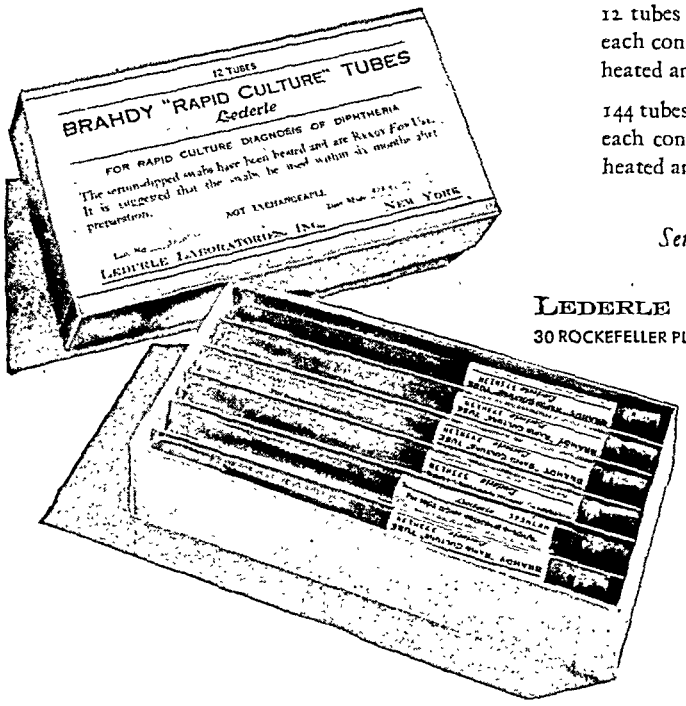
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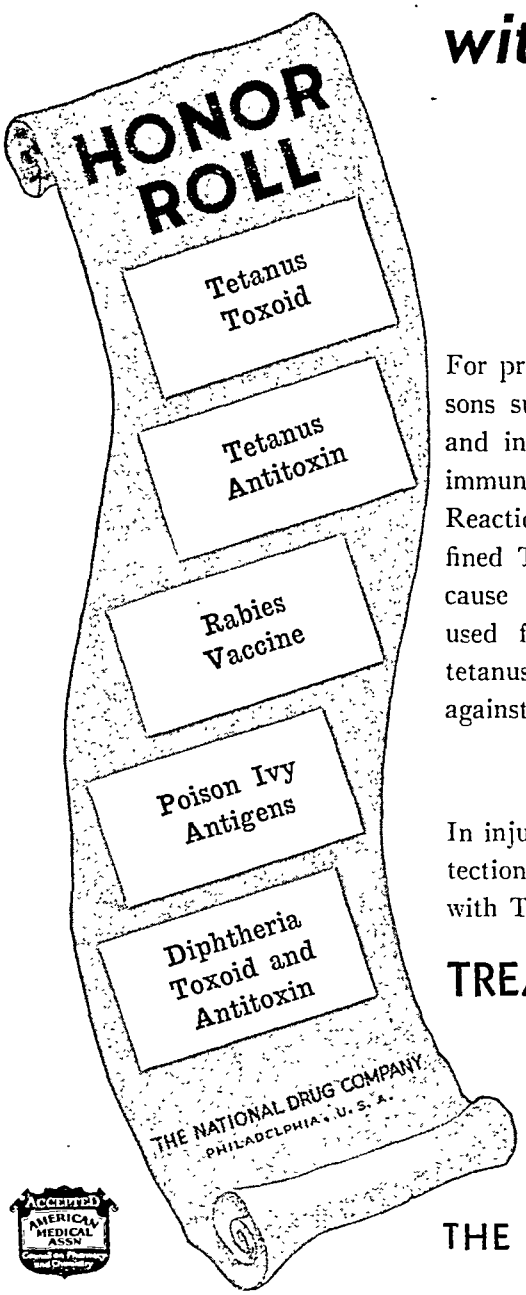
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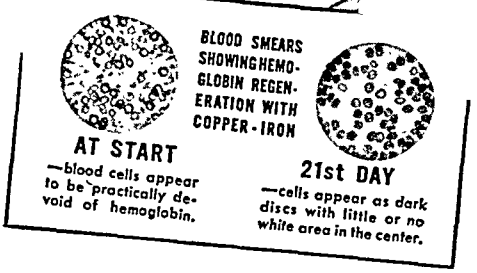
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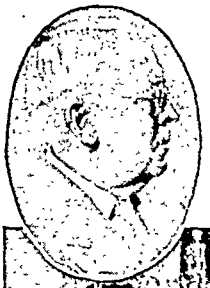
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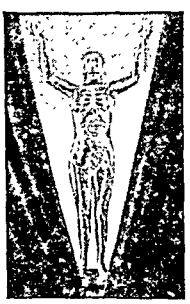


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FLORIDA PUBLIC HEALTH ASSOCIATION S G *Thompson*, D P H, State Board of Health, Jacksonville	Tallahassee, December
GEORGIA *PUBLIC HEALTH* ASSOCIATION M E Winchester, M D, Commissioner of Health, Brunswick	*To be announced*
MASSACHUSETTS *PUBLIC HEALTH ASSOCIATION* G Donald Buckner, 43 Coolidge Avenue, Needham	*To be announced*
MICHIGAN PUBLIC *HEALTH* ASSOCIATION Marjorie Delavan, State Department of Health, Lansing	Lansing, Nov 10-12
MISSOURI PUBLIC HEALTH ASSOCIATION John W Williams, M D, County Health Officer, Springfield	To be announced
NEW MEXICO PUBLIC HEALTH ASSOCIATION Paul S Fox, Box 711, Santa Fe	To be announced
NORTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION I O Church, M D, Alameda County Hospital, Oakland.	To be announced
OHIO FEDERATION OF PUBLIC HEALTH OFFICIALS W D Bishop, M D, Darke County Health Unit, Greenville	*Columbus*, November
PENNSYLVANIA PUBLIC HEALTH *ASSOCIATION* J M J Raunick, M D, Health Officer, Harrisburg	To be announced
PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY Frank Kiernan, 386 Fourth Avenue, New York	To be announced
SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION Laura Blackburn, State Board of Health, Columbia	To be announced
SOUTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION R L Kaufman, M D, 402 So Greenleaf St, *Whittier*	To be announced
TEXAS PUBLIC HEALTH ASSOCIATION P A Kerby, State Department of Health, Austin	El Paso, October
VIRGINIA PUBLIC HEALTH ASSOCIATION B B Bagby, M D, Pres, 1302 Avondale Avenue, Richmond	To be announced
WEST VIRGINIA PUBLIC HEALTH ASSOCIATION Dr. Edwin Cameron, Wetzel County Health Dept, Martinsville	October
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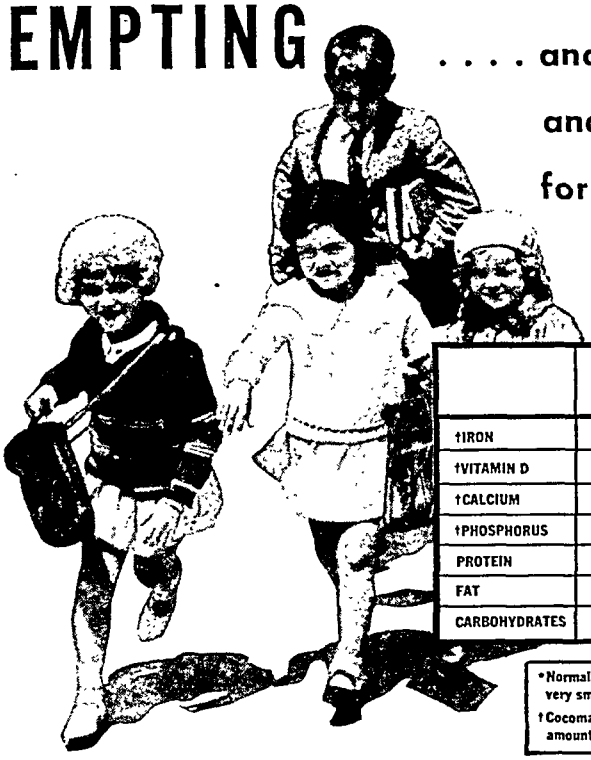
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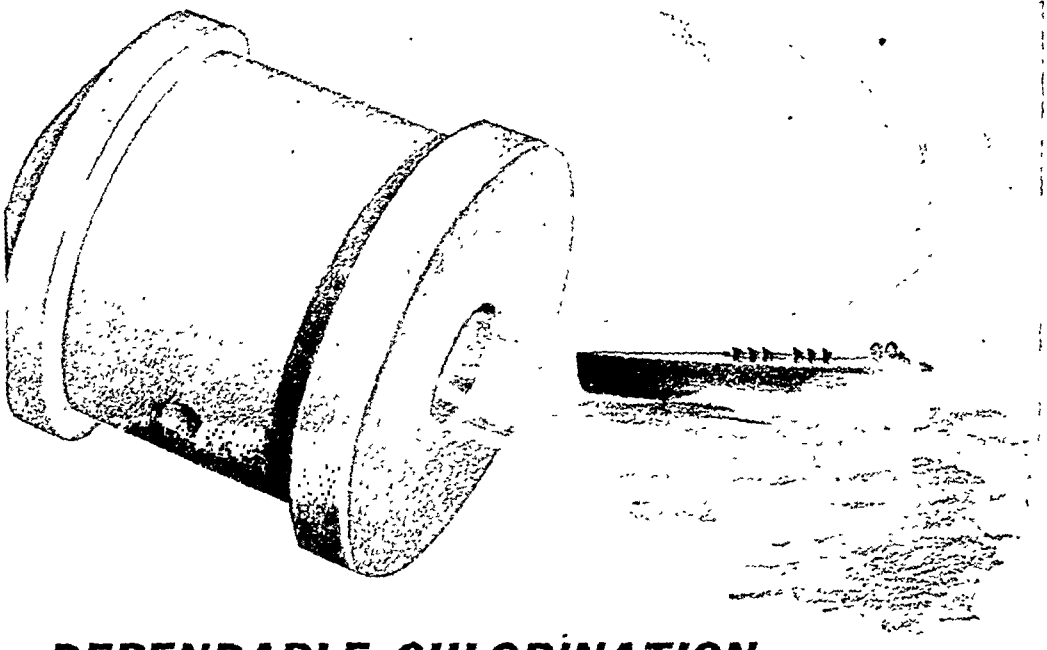
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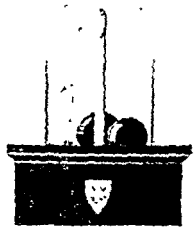
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American Journal of Public Health
and THE NATION'S HEALTH

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Pneumonia and Tuberculosis Among Industrial Workers and Their Dependents*

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SIX years ago, after 5 years of compilation, a preliminary report was made on this study before this Section. The report was made at that time because it was felt that certain conclusions were warranted as tending to upset rather prevalent ideas regarding the influence of some specific occupational hazards in connection with underground employment.

It was suggested at that time, that such a study to be of value should cover a large number of individuals or extend over a longer period of time.

It is significant that although the present report embraces a period of 11 years, against 5 years of the preliminary study, and includes 3,780 cases of pneumonia with 739 deaths, against 2,603 cases and 238 deaths, the fatality rates in the various groups remain to all intents and purposes unchanged. It may be also noted that the relative fatality rate in any given group for any single year is almost identical with that of any other single year, group of years, or the whole.

There is need for intensive study and research, much of which should be of a statistical nature, before the exact influence of so-called industrial hazards is understood. It is believed that a great many of the existing state compensation laws are far in advance of precise knowledge, being based upon what some individual believes to be true though that individual may or may not be in possession of sufficient knowledge of the subject to entitle him to an opinion.

It is well within the responsibility of the membership of the Industrial Hygiene Section of the American Public Health Association to make needed studies, placing the knowledge so gained at the disposal of those who may find themselves responsible for legislation intended to protect industrial workers. It should be remembered that industry

* Read before the Industrial Hygiene Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

also, if it is to survive, must be protected from unjust claims.

No individual or group of individuals is more alive to the need for protecting the workers' health, and the prevention of industrial accidents, than those who make up the motivating force of industry. The disabled workman, whether from illness or accident, is a liability expensive to the industry. It is a duty devolving upon this body to point out to industry the existence of hazards, and you may rest assured that industry stands ready with an appreciation of substantial character for all worthy effort in this direction. Notwithstanding recent governmental interest in the welfare of industrial workers, it is almost certain that the interest of industry would render protective legislation superfluous in the presence of exact knowledge of its needs.

In obtaining population figures for some of the groups included in this study it has been necessary to use estimates. The number of workers can be obtained from pay roll figures. The number of dependents has been arrived at by assuming 3 for each wage earner. This is believed to be conservative inasmuch as a reciprocal of from 3.10 to 3.25 has been variously used in authoritative statistical studies.

Our population, averaging slightly more than 77,000 persons over the period covered by this study, is divided into:

1. Dependents: All males under 16 years and dependent females of all ages
2. Surface Workers: All employees whose duties are above ground
3. Coal Miners: All underground workers in the coal mines
4. Ore Miners: All ore mine employees whose duties are underground during the working shift

A great deal of thought has been given, since the observations of Ramazini (1703), to the influence of exposure of miners to a dust laden atmosphere. Assumptions have been made many times as a result of pure speculation. Probably the most valuable additions to exact knowledge in recent years have resulted from studies made by Sayers and his associates of the U. S. Bureau of Mines.

Our company operates a number of soft coal mines in which all undercutting is done by machines equipped with a water spray directed at the point of cutting units. The coal is shot down, and shots are tamped with clay. Haulage ways are covered with crushed open hearth slag which is kept damp by sprinkling. Practically the only dust is that which results from handling coal in loading.

No readily observed dust is present in our coal mines, yet that dust is in the atmosphere, is demonstrated on the faces, arms, and hands of those who have spent a working shift underground. The same holds true in our red ore mines. Notwithstanding every effort to prevent dust it is present as is demonstrated on the clothing and persons of all who work inside.

Pneumonia Incidence: Dependents, a group which includes 75 per cent of our population, have given us 69.9 per cent of the pneumonia cases.

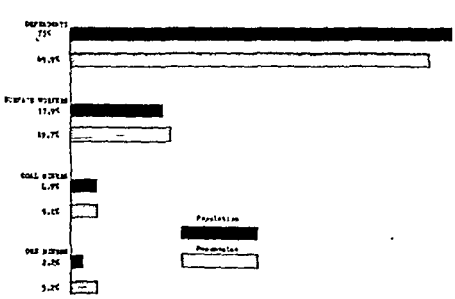


FIGURE I—*Comparative Population and Pneumonia Case Distribution by Occupational Status*—In this chart an attempt has been made to show relatively the proportion of total population in each group together with the percentage of total pneumonia cases occurring in each group.

Surface employees, constituting 17.9 per cent of the population, have contributed 19.7 per cent of the cases.

Coal miners who make up 4.9 per cent of the population have contributed pneumonia cases in almost the same proportion as they bear to the population, with 5.1 per cent of the cases.

Ore miners, on the other hand, while only accounting for 2.2 per cent of the population, have furnished 5.2 per cent of the pneumonias—more than twice the number of cases to which their relative number alone entitles them.

Fatality Rates: There is apparently no relationship between the frequency with which a given group has shown itself susceptible to pneumonia and the regularity with which death occurs among those in that same group who have the disease. Surface employees, for instance, considered as an occupational group, including both white and colored, with an incidence only slightly above what might have been expected, have had a fatality rate, expressed in number of deaths per 100 cases, of 30.7, the highest of any group. Coal miners have died at a rate of 26.8 per 100 cases, while ore miners had a fatality rate of 24.8, the lowest of any wage earning group.

A further breaking up of these groups

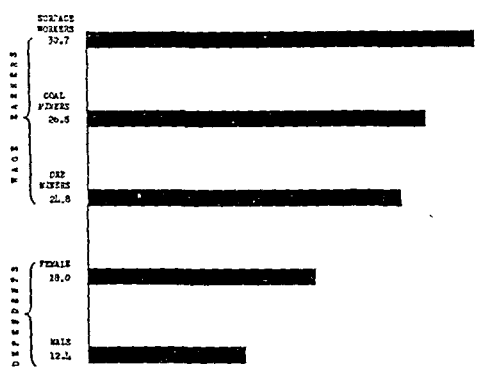


FIGURE II—*Pneumonia Fatality by Occupational Groups*—Eleven Years, 1925–1935—Deaths per 100 cases.

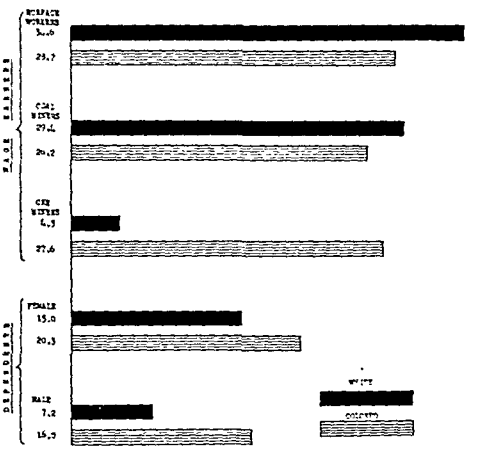


FIGURE III—*Pneumonia Fatality, Occupational and Color Groups*—Eleven Years, 1925–1935—Deaths per 100 cases.

into white and negro presents certain other surprising facts. Surface workers, white, have had a rate of 34.6 against 28.7 for colored.

This appears still more irregular when it is remembered that "white surface employees" embrace school teachers, physicians, superintendents, clerks, accountants, and all skilled workers, while "colored surface employees" include all engaged in the more laborious duties.

White coal miners have had a higher fatality rate than negroes employed at the same work; the rate being 29.4 for white and 26.2 for colored.

Only 1 death has occurred in 11 years in the white ore miner group. It is true the group is small and only 23 cases have occurred, but no other group, including the younger ages, has had 23 successive cases with but a single death. The rate is 4.3 for white and 27.6 for colored ore miners.

With an almost perfect similarity in environmental working conditions which might be expected to influence fatality, it is difficult to understand the disparity between white and colored rates in the same occupational group, or the varying

TABLE I

Tennessee Coal, Iron and Railroad Company
(Health Department)

Pneumonia Cases and Deaths by Age, Sex, Color, and Occupational Groups
Eleven Years, 1925–1935, Inclusive

Age Groups				*Under 1*		*1 to 4*		*5 to 14*		*15 to 24*		*25 to 34*		*35 to 44*		*45 to 54*		*55 to 64*		*Over 65*		*Totals*	
C—Cases *D*—Deaths				*C*	*D*	*C*	*D*	*C*	*D*	*C*	*D*	*C*	*D*	*C*	*D*	*C*	*D*	*C*	*D*	*C*	*D*	*C*	*D*
Non-wage Earners	Male	W		48	13	216	13	217	9	16	1	..	..	..	..	..	..	..	..	..	..	497	36
		B		132	65	340	31	220	14	25	5	..	..	..	..	..	..	..	..	..	..	717	115
	Female	W		47	13	158	9	213	6	42	8	46	10	34	5	30	11	19	10	37	22	626	94
		B		99	36	245	31	153	15	100	19	110	23	58	16	16	9	14	9	10	6	805	164
All Wage Earners	Surface Workers	W		..	..	..	..	..	..	47	12	57	16	58	16	46	14	18	10	28	20	254	88
		B		..	..	..	..	..	..	149	32	166	43	96	28	51	21	10	5	18	12	490	141
	Coal Miners	W		..	..	..	..	..	..	4	..	1	..	12	2	5	1	..	..	12	7	34	10
		B		..	..	..	..	..	..	27	7	68	13	32	9	21	8	10	3	2	2	160	42
	Ore Miners	W		..	..	..	..	..	..	7	..	11	1	3	..	2	..	..	..	..	..	23	1
		B		..	..	..	..	..	..	50	14	67	12	34	11	21	10	1	..	1	1	174	48
Totals		W		95	26	374	22	430	15	116	21	115	27	107	23	83	26	37	20	77	49	1,434	229
		B		231	101	585	62	373	29	351	77	411	91	220	64	109	48	35	17	31	21	2,346	510
Grand Totals				326	127	959	84	803	44	467	98	526	118	327	87	192	74	72	37	108	70	3,780	739

fatality rates exhibited by whites in the different occupational groups, while negroes exhibit a fatality rate varying so little in the different groups as to be of no significance.

Why should white surface workers, for example, have 34.6 deaths for each 100 who have pneumonia and negroes 28.7, while white coal miners have a fatality of 29.4 and colored coal miners 26.2? Or, why should colored ore miners with pneumonia die at the rate of 27.6 per 100 cases while whites only have a rate of 4.3?

Again, whatever influence may have operated to produce a more fatal pneumonia in white workers of one occupation above that of another has been signally impotent in the case of negroes of the same occupational groups.

Colored surface workers have had a rate of 28.7 as against a rate of 27.6 for colored ore miners and 26.2 colored coal miners.

A reduction of the figures so far quoted to deaths per year, per 1,000, in each of the groups studied, tends to give us the picture from a slightly different angle. An average of 57,831 dependents have had 409 of their number die of pneumonia in 11 years, 229 deaths have occurred in a group of surface workers averaging 13,802 persons, while 52 deaths have occurred in a group of 3,778 coal miners, and of 1,696 ore miners 49 fatal pneumonias have occurred.

It has been assumed, with apparent reason, that an etiologic factor which conduces to fatal pneumonia might be expected to exhibit a similar influence on the tuberculosis death rate.

The failure of pneumonia death rates to show a correlation with those from tuberculosis in workers in the same occupational groups has been something of a disappointment.

"All Dependents" have had a death rate, expressed in deaths per year, per 1,000, of 0.643 for pneumonia and 0.337 from tuberculosis. Surface workers have had a pneumonia death rate of 1.508, while their tuberculosis rate has been 0.566. Coal miners have died of pneumonia at a rate of 1.251 and of tuberculosis at a rate of 1.467, and ore miners have had a pneumonia rate of 2.626 against a tuberculosis rate of 1.232.

To express these death rates in a way which makes the picture more vivid: It has taken 1,554 dependents each year to furnish 1 pneumonia death and 2,965 for each death from tuberculosis; of each 663 surface workers 1 has died annually from pneumonia and it has required 1,769 of them to furnish 1 tuberculosis death. Coal miners have had 1 death per year from pneumonia for 803 persons and 1 from tuberculosis for 687, while 385 ore miners have contributed 1 annual pneumonia death it has required 807 ore miners for each death from tuberculosis.

The figures given may serve to disillusion those who may have gotten an impression from the earlier part of this report that a red ore mine was being proposed as a sanctuary for persons suffering from a pneumonophobia.

Nomenclature for the Colon Group*

ROBERT S. BREED, PH.D., F.A.P.H.A., AND
JOHN F. NORTON, PH.D., F.A.P.H.A.

Chief in Research, New York Agricultural Experiment Station, Geneva, N. Y.; and Head, Bacteriological Department, The Upjohn Company, Kalamazoo, Mich.

THE importance of the aerobic, non-spore-forming lactose fermenting bacteria in the bacteriological examination of water supplies is too well established to require any argument or any apology for this discussion. During the last few years this group of bacteria has acquired importance in the milk industry because of its value not only as an index for the control of pasteurization but also as a tool for use in tracing the source of contamination in milk subsequent to pasteurization.

These bacteria have appeared under a variety of names both in the literature dealing with the practical aspects of water and milk analysis and in systems of bacterial classification.[4, 5, 6] The former use will be considered here, since even the simplest nomenclature satisfactory to the taxonomist is more elaborate than is needful in practical work.

The terms used most commonly in practical work are: "*B. coli*," "*E. coli*," "colon," "colon-aerogenes," "coli-aerogenes," "Escherichia-Aerobacter," "coliform."[1] These words have been used to signify the group of organisms defined "as including all aerobic and facultative anaerobic Gram-negative non-spore-forming bacilli which ferment lactose with gas formation." This definition is intended primarily to include the genera frequently called "Escherichia" or "Aerobacter" and the so-called "intermediate" or "Citrobacter" types; and has been criticised both as being too broad and as being too narrow.

While organisms of the genus Escherichia are generally accepted as an index of sewage contamination, there is discussion concerning the significance of organisms classed as "Aerobacter" and "Citrobacter." In a very general way, bacteria of the two latter groups represent a distinctly less dangerous type of contamination than does the Escherichia group, but practically all investigators find the Aerobacter-Citrobacter group in the human intestines at times. Their presence in the soil is admitted by all. There is unanimity in excluding soil drainage from water supplies unless careful sanitary surveys have shown the impossibility of sewage pollution, a condition too often uncertain of proof. The water sanitarian therefore seems justified in insisting that a satisfactory drinking water should be "relatively free" from the bacteria of these 3 groups. Whether none of the organisms should be found in 10 c.c., 2 in 100 c.c., or none in 500 c.c. does not

* Read before the Laboratory Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 22, 1936.

concern us here except to point out that artificially purified drinking water can be made to conform to more rigid standards than are at present in use and that there is no justification for attempting to separate fecal from so-called non-fecal strains of lactose fermenters in evaluating these treated water supplies. Possibly an exception will have to be made for surface waters treated only with chlorine but this is not a situation to be tolerated except when the surface supply is collected from controlled water sheds and known to be relatively free from pollution.

The usefulness of tests of organisms of the Escherichia-Aerobacter types and so-called intermediates in dairy products has been complicated by a tendency on the part of many workers to carry over the interpretations of results from the water sanitation field into the dairy field. The newer work in the latter field indicates the value of tests for readily identified types of bacteria that should certainly be killed where pasteurization is properly carried out at a temperature of 143–145° F. for 30 minutes. The routine tests for contamination after pasteurization should be of such a character as to identify readily organisms of these types that have been reintroduced. The newer types of plating media such as violet-red-bile-agar and sodium desoxycholate agar are used for the purposes indicated, but the group of organisms that produce acid and show as red colonies is a somewhat broader group than would be covered by the definition quoted above for the Escherichia-Aerobacter group. Where the group referred to is broader than that described above the terminology should be different from that used in water sanitation. It is highly desirable for workers to use terms with more definite meanings than has been the case in the past.

In the field of shellfish sanitation,[8] some workers have felt that organisms of the Escherichia type indicate fresher, more direct and therefore more dangerous sewage pollution than organisms of the Aerobacter type. If such an interpretation of conditions in tidal river waters should prove to be the case, the terminology used in this field should likewise be definite and different from that used in water and sewage sanitation. If reference is made to organisms of the genus Escherichia only, the terminology used should indicate that fact.

In the water and sewage field there has been much discussion over the problem whether organisms of these general types could be classed as fecal or non-fecal. It will be noted that this discussion is quite different from the basic ideas that are important in the dairy and shellfish sanitation fields. In the dairy field it is a question of distinguishing between organisms killed at pasteurization temperature and those that are sufficiently heat resistant to survive these temperatures. In the shellfish field the discussion is over the question whether organisms indicating less immediate pollution, can be ignored. Much confusion is caused in discussions where these facts are not kept in mind. New definitions with different terminology would apparently be called for where a broader, or a narrower group than the one usually accepted for organisms of the Escherichia-Aerobacter type are under consideration.

For some years the authors of this paper have carried on a friendly correspondence concerning the name to be used in the two most important Standard Methods reports that have been stimulated by the American Public Health Association. Each has been able to find real objection to the other's suggestions and arguments, and both botanical and classical friends have been consulted in order to obtain ammunition intended

for the destruction of his opponent's ideas. The whole discussion has tended to clarify the differences in needs and interpretations that should be used in the two related, but quite different, fields of sanitation. The discussion has ultimately led us to the place where we are now able to agree upon a term which apparently meets the needs of workers in the field of water and sewage sanitation, and has the advantage that it is a simple non-technical term, readily understood by men who are not familiar with the technical problems of taxonomic bacteriology. It likewise does away with the use of such terms as "*B. coli*" which in its more complete form of *Bacillus coli* has been discarded by bacteriologists for many years, international agreement having been reached this last summer that the term "Bacillus" is to be limited in the future to spore-forming rods. It does away with the similar and even more objectionable "*E. coli*" which in the last few years has created difficulty for certain editors of scientific journals because of the fact that not only *Escherichia coli* but *Entameba coli* are found in fecal matter and they have written out "*E. coli*" in certain manuscripts as *Escherichia coli* when it really was intended for *Entameba coli.*

We jointly suggest that the group as defined above and as used in the field of water and sewage sanitation be designated as the "coliform group" and suggest that sanitarians in the dairy and shellfish fields be very careful to use a terminology that does not either broaden or restrict the definition of the group of organisms included under this term.

One other phase of the general problem seems desirable to mention. The use of the presence of the coliform group as an index of pollution is well established, and no one can doubt that it has played an important rôle in the improvement of water supplies during the past 30 years. There is no reason, however, that we should assume a satisfied attitude and allow our minds to remain dormant in the face of certain very definite facts. In 1931, Veldee[7] reported apparently a water-borne outbreak of gastroenteritis in West Virginia (Oct. and Nov., 1930) during a time when the purified water supply showed a "*B. coli*" index of 0.0. Whether this outbreak was due to the presence of a chemical irritant or to a "bacterium or virus whose presence was not indicated by the established methods of water analysis" is not known. A somewhat similar outbreak in Missouri is being reported at this session by Ziegler.* Very recently, Heathman, Pierce, and Kabler,[2] as a result of studying the disinfecting action of chlorine and chloramines in treated waters have noted the possibility of the typhoid bacillus persisting longer than the organisms of the coliform group, and suggest a reconsideration of the use of this latter group as the sole index for the safety of a water supply. (See also studies by Kriebel.[3]) Such experiences as these cannot be ignored and serve to remind bacteriologists that sanitary analysis is a live issue.

SUMMARY

We suggest the introduction of the term "coliform" to designate the lactose fermenting aerobic bacteria used as a measure of pollution of water. It is hoped that when the same term is applied in milk and oyster examination it will be used with a similar meaning.

We ask your reconsideration of the use of the coliform group as the sole index of dangerous contamination of water supplies. It is possible that some further index may be required to serve as a supplementary aid.

* See March issue of *A.J.P.H.*

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No Typhoid in New York State

FOR the first time in the state's history, New York reports not a single death from typhoid fever during the entire month of March, 1937.

Dr. J. V. DePorte,* director of the Division of Vital Statistics, State of New York, Albany, reported that 30 years ago 117 persons died from the disease during the month of March. Twenty years ago there were 40 deaths, and 10 years ago the number had dropped to 11.

New low rates were established for measles with 0.7 per 100,000 population, and scarlet fever 1.6. The death rate from whooping cough, 1.7, was double the corresponding figure of a year ago. There were 7 deaths from diphtheria, all in New York City, compared with only 2 in March, 1936. —*News Release*, New York State Dept. of Health.

* Fellow A.P.H.A.

Comparison of Solid With Liquid Media as a Means of Determining the Presence of Lactose Fermenting Bacteria in Pasteurized Milk*

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IT is becoming increasingly evident that a test for organisms of the Escherichia-Aerobacter or coliform group is extremely valuable as a means of detecting recontamination of pasteurized milk. Selective media, although inhibiting the coliform group to a certain extent, must be employed to prevent overgrowth by other types. For this purpose many different media have been proposed. Brilliant green lactose peptone bile broth and formate ricinoleate broth are commonly used in this country for work with dairy products.

Detection requires a qualitative, and enumeration a quantitative procedure. A single tube shows whether coliform organisms are present or absent, but when the result is positive gives no indication of the number. If the enrichment method employing liquid media is to give a fairly accurate idea of numbers, it is necessary to employ a total of at least 15 tubes, or 5 tubes each in 3 decimal dilutions so selected that all tubes will be positive in the lowest dilution and negative in the highest dilution. Since an agar plate covers a greater range in numbers than a broth tube, duplicate agar plates yield as reliable a count as 15 tubes. However, this statement is unfair to the dilution method as used under practical conditions since the majority of samples of pasteurized milk examined by public health workers contain less than one coliform organism per ml. Obviously, a negative tube gives as much information as a negative plate. The plate becomes progressively more and more quantitative than the tube as the number of coliform organisms increases.

The preparation of 15 tubes covering 3 dilutions and the converting of results into most probable numbers involves more work than the preparation and counting of 2 agar plates. If a satisfactory agar medium were available, it might be of value under certain conditions.

The purpose of this study was to compare various solid media and to determine those conditions under which it is of value to use a plating procedure in the examination of pasteurized milk for lactose fermenting organisms.

* Approved by the Director of the New York State Agricultural Experiment Station for publication as Journal Paper 205, Apr. 30, 1937.
Read before the Laboratory Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 22, 1936.

RESULTS OBTAINED

Much of the previous work with solid media has been done with dairy products in which coliform counts were in hundreds or thousands per ml., so that it was not necessary to employ dilutions lower than 1:100. It has been shown in the case of many of these agars that the inhibitory power toward Gram-positive organisms was greatly decreased with the increase of concentration of milk added. This limits the usefulness of these media for the examination of pasteurized milk which under present conditions should be free from coliform organisms in quantities at least as large as 1 ml.

In an attempt to find an agar medium which would be practical for the examination of pasteurized milk, 10 agar media were compared with respect to their value for plating 0.1 and 1.0 ml. quantities of milk. These were: Conradi-Drigalski [1] (1902); Endo [2] (1904); Mac Conkey [3] (1905); Ayers and Johnson [4] (1915); Ayers and Rupp [5] (1918); Levine's [6] eosin methylene blue (1918); Chalmers [7] taurocholate (1928); Klimmer's [8] trypaflavine (1929); Noble's [9] ferrocyanide citrate (1932) and Leifson's [10, 11] desoxycholate agar (1934 and 1935). Comparisons were made on 25 samples of raw milk delivered by producers to a local pasteurizing plant. Coliform counts ranged from less than 1 to 36 per ml.

The desoxycholate agar gave the best plates from all standpoints and was the only medium which showed promise when 1 ml. quantities of milk were plated directly. One or two modifications of all 10 media failed to improve results materially and the desoxycholate agar was selected for further study.

At this time several special experimental bile salt agars * previously found promising by other workers were selected for study. These were compared with each other and with the desoxycholate agar. The best of the experimental agars proved to be one now on the market under the name of "Bacto-violet red bile agar." This medium permitted the direct plating of 1 ml. quantities of milk and gave results as good as the desoxycholate agar.†

The only ingredients common to both media were peptone (1.0 per cent), lactose (0.5 to 1.0 per cent), and the indicator neutral red (0.0033 to 0.005 per cent). In addition, desoxycholate agar contained sodium chloride (0.5 per cent), dipotassium phosphate (0.2 per cent), ferric ammonium citrate (0.2 per cent) and the bile salt, sodium desoxycholate (0.1 per cent). The violet-red bile agar contained yeast extract (0.5 per cent), crystal-violet (0.0004 per cent) and special bile salts (0.1 per cent).

These media are used in the same manner. Best results are secured if about 15 ml. of agar at a temperature of 45° C. are poured per plate. After solidification, repouring with a thin surface layer of agar is desirable in order to secure a uniform appearance of red colonies. Typical coliform colonies are deep red in color and usually from 1 to 2 mm. in diameter after 15 to 24 hours' incubation at 37° C. A longer incubation is undesirable due to growth of slow acid producers which may form red colonies.

It is our experience, based on a study of approximately 1,000 samples of raw milk from 85 producers, that colonies which are deep red in color on this medium and which are 1 mm. or over in diameter will produce gas in lactose broth in at least 90 per cent of the cases. Red colonies between 0.5 mm. and 1.0 mm. in diameter produce gas in only

* Manufactured by Difco Laboratories, Inc.

† Manufactured by Baltimore Biological Laboratory. Since this work was done, a powdered desoxycholate lactose agar of different composition has also been placed on the market by this company.

about 25 per cent of the cases while red colonies less than 0.5 mm. in diameter rarely form gas from lactose.

The plating method was frequently found to be unsatisfactory for the examination of raw milk representing individual producers. In probably 25 per cent of the samples of raw milk, border-line types approaching coliform colonies in size or color were present to such an extent that an accurate differential count could not be made. Pasteurized milk was next studied. Plate counts with one or both of the media described were made on 426 samples of pasteurized milk representing 126 New York State dealers. Border-line types of colonies were rarely observed. Of the 426 samples, 295 were process samples taken monthly for 1 year at two local pasteurizing plants and plated in 1 ml. quantities on desoxycholate agar. Red colonies present in 49 of 295 samples always formed gas when inoculated into lactose broth and were typical of the coliform group when streaked on eosine-methylene-blue agar.

Twenty-six of the samples of pasteurized milk representing 19 dealers were obtained through the courtesy of the Rochester Health Bureau laboratories. These were plated in 1 ml. quantities on both violet-red bile agar and desoxycholate agar. Red colonies were present on 12 violet-red bile agar plates and 14 desoxycholate agar plates. Counts of red colonies on the 2 media were approximately the same. When a single representative red colony was picked from plates to lactose broth fermentation tubes and incubated for 48 hours, only 11 out of 26 fermentation tubes showed visible gas formation. This indicated that the count of typical red colonies sometimes included non-gas as well as gas formers and therefore represented a somewhat broader group, than are included in the definitions used in the *Standard Methods* Reports on Water and milk for the coliform group.[1]

One hundred and five of the samples of pasteurized milk were obtained through the courtesy of Dr. Robertson, of the New York State Food Laboratory. These were street samples from different New York State dealers. Single tubes of brilliant green and formate ricinoleate broths were inoculated and a single red bile agar plate poured with 1 ml. quantities of milk. Stark and Curtis [12] had already found by using pure cultures that lactose fermenting spore formers produced false tests in brilliant green bile broth, but not in formate ricinoleate broth when 1 ml. quantities of milk were used as the inoculum. However, in practice, a positive brilliant green and a negative formate ricinoleate tube may not be due to the presence of false test organisms but to sampling error when only a very few coliform organisms are present which are introduced into one tube but not into the other.

Therefore, further inoculation of a second formate tube from the positive brilliant green tube was employed since a positive result in the second formate tube would indicate that coliform organisms were present and that the difference was due to sampling error, whereas if the second formate tube were negative, lactose fermenting spore formers would probably be responsible for the false brilliant green test.

Certain members of the genus Salmonella may ferment the formate in formate ricinoleate broth with production of gas but are unable to produce gas from brilliant green bile broth. A negative brilliant green tube accompanied by a positive formate tube may then be used in the opposite manner by inoculating a second brilliant green tube from the positive formate tube to show whether or not members of the genus Salmonella are present.

In 23 cases out of 105, gas was

formed within 48 hours in both liquid media and in 6 instances in only 1 medium. When a tube of the negative medium was inoculated from the positive tube of the other medium, positive results were always obtained, indicating that the initial difference was not due to the presence of false test organisms. From this, it is concluded that false tests rarely occur either in brilliant green or formate ricinoleate broth when pasteurized milk is examined. This is important since it indicates that the presumptive test alone is satisfactory for pasteurized milk for all practical purposes.

In 17 of 105 samples only typical red colonies were present on the red bile plates and these were found to produce gas from lactose broth in 16 cases. Only 3 plates contained border-line types of colonies which routine workers might have mistaken for typical coliform types. Gas formers were isolated in only 1 of the 3 cases. Results from plates in general agreed well with results from tubes.

However, in contrast to 2 cases where agar plates showed typical red colonies while no gas appeared in brilliant green tubes, there were 10 in which the reverse condition was true, suggesting but not conclusively showing that the red bile agar was somewhat more inhibitive than the brilliant green broth. In contrast to 3 cases where agar plates showed typical red colonies while there was no gas in formate ricinoleate tubes, there were 9 in which the reverse was true, which again suggests that the red bile agar was somewhat more inhibitive. However, very few coliform organisms were present in the 12 samples involved since there were 5 in which gas was formed in one broth but not in the other. In 11 of the 12 cases, 48 hours was required for gas formation. Where tubes were positive but plates negative, only 3 out of 10 brilliant green and 2 out of 9 formate ricinoleate tubes could be confirmed. Failure to confirm results was probably due to the fact that there were only one or two coliform organisms per ml. in the sample and these either died out after gas was formed or were so completely overgrown by other types that they were not recovered. Probably confirmation would have been obtained in more cases if tubes had been plated in 24 hours instead of being streaked on eosin-methylene-blue agar at the end of 48 hours. It is unlikely that these were false tests.

SIGNIFICANCE OF PLATE COUNTS

Bacteria forming red colonies upon these agar media regardless of whether they ferment lactose with gas formation, are significant if destroyed by proper pasteurization, since their presence in freshly pasteurized milk then indicates recontamination. Thus, measurement of this group that is somewhat broader than the coliform group of organisms is an advantage under these conditions.

Boundary lines between the genera Escherichia and Aerobacter and other closely related genera in the colon-typhoid group are very indefinite. Also, in the coliform group, it has been well established that there are slow lactose fermenting strains, lactose degraded strains, and strains which form gas from lactose at some temperatures but not at others. To what genera do the red acid forming colonies belong which do not form gas in 48 hours when picked to lactose broth? *Bergey's Manual* (4th ed.) lists 15 species in the genus Achromobacter, 7 in the genus Eberthella and 4 in the genus Shigella which ferment lactose with acid but not gas production. Based on descriptions, many of these species, both in the same and in different genera, appear to be the same. Identification of these border-

line organisms is difficult owing to this confusion in classification.

A total of 44 cultures, isolated from raw milk, pasteurized milk, and ice cream, which closely resembled typical coliform colonies yet failed to produce gas in 48 hours when first picked to lactose broth, received detailed study (Gram stain, MR-VP test, gelatin liquefaction, indol production, nitrate reduction, appearance in litmus milk, motility and action on glucose, lactose, sucrose, dulcitol and salicin). These were all Gram-negative, non-spore-forming rods which grew aerobically on agar slants. Approximately 50 per cent (23 out of 44) can be placed in the genus Achromobacter although this is an indefinitely defined genus. They might better be placed in the genera Eberthella and Shigella which are more closely related to the coliform group.

Eleven cultures, 9 of which were from raw milk, might be placed in the genus Flavobacterium because of their yellow pigmentation; 5 were slow gas formers otherwise resembling strains in the genus Aerobacter. Three cultures belonged to the genus Escherichia. Although they failed to form gas from lactose upon the initial transfer, they later formed abundant quantities. One culture was placed in the genus Serratia and one in the genus Alcaligenes. One culture formed abundant gas from lactose at 30° C. but not at 37° C.

DISCUSSION AND SUMMARY

In a broad sense, all red acid forming colonies larger than 0.5 mm. which grew on the media described under the conditions specified, either belong or are closely related to the coliform group; yet, it seems unwise to accept a count of red colonies as a coliform count since it does not conform to our standardized and accepted procedure in water and milk analysis of recognizing only those forms in the coliform group which produce gas from lactose in 48 hours. Therefore, it would seem wise to use another expression such as " red or acid colony count " until it is established by study of representative colonies that they really belong to the coliform group as defined in the *Standard Methods* reports.

The majority of samples of pasteurized milk examined in public health laboratories are bottled street samples. A positive result usually means that the product is recontaminated but gives no indication as to degree since growth may have taken place in the bottle. A negative result does not mean freedom from recontamination since it is well known that the milk bottled during the middle or toward the end of the run may be free from coliform organisms due to their being previously rinsed from the equipment. Samples of unknown origin such as street samples do not merit quantitative analysis, and the single broth tube is sufficiently accurate under these conditions. The single tube is preferable to the single plate since it is simpler and quicker.

Quantitative results are justified in the case of process samples taken as a follow-up to qualitative results secured with street samples. It is here that the plate method is of value for it gives a clear picture of sources of recontamination, and the inclusion of non-gas-forming organisms is not an objection since the sample of pasteurized milk taken from the holder directly after pasteurization serves as the control. Process samples should include the first milk over the equipment and the first milk bottled in order to measure the maximum amount of recontamination.

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International Health Congress in 1939

PLANS are being made for the holding of an International Health Congress during the New York World's Fair in 1939. In a statement to the press, Donald B. Armstrong, M.D.,* President of the National Health Council, explained that advantage will be taken of the fact that hundreds of noted medical specialists and public health authorities, representing many countries, will be visiting New York City at the time of the World's Fair. American and foreign specialists will be asked to deliver addresses on subjects of interest not only to professional groups, but also to the general public.

The last Health Congress such as the one scheduled for 1939 was held at Atlantic City in 1926. Plans for the 1939 sessions are being perfected by the National Health Council in collaboration with the World's Fair Advisory Committee on Medicine and Public Health, which is headed by Louis I. Dublin, Ph.D.* The program will be related, as much as possible to the exhibits on medicine and public health that will be on display at the World's Fair; and it is hoped that a permanent American Museum of Hygiene similar to the German Hygiene Museum in Dresden will be established in New York subsequently.

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Nutritional Economics of Dietary Calcium

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CALCIUM has been the subject of hundreds of papers and discussions. Frequently attention has been focused on either the chemical, physiological, nutritional, or dietetic aspect of the element. Cost of calcium in the various forms of foods and pharmaceuticals has also been mentioned from time to time, but apparently with insufficient effect. Comprehensive summaries arranged from multiple points of view, including especially nutrition and economics, are rare indeed. It is thought that a survey of the cost of calcium in the foods especially noted for their minerals and in other calcium sources may be interesting to this group which is concerned with improving public health through foods and nutrition.

If most of our people ate what is thought to be enough calcium, this paper would not have been prepared. According to authoritative opinion, however, calcium is often consumed in too limited quantities. For example, Sherman [1] wrote as recently as 1932:

> The "ordinary mixed diet" of Americans and Europeans, at least among dwellers in cities and towns, is probably more often deficient in calcium than in any other chemical element.

There has been little or no improvement since 1932. The facts that calcium occurs in the human body more abundantly than any other mineral element, and that its shortage leads to a variety of serious malconditions make its lack a point of primary significance.

This paper, therefore, relates to nutritional calcium as it applies to our general human populace. The unfortunately wide gap between scientific information and actual consumption of this dietary essential might well be narrowed. Authorities on nutrition have emphasized that average or so-called normal nutrition may be far below optimal nutrition; the latter being that state of nourishment which promotes buoyant health. There are many millions of people who do not even enjoy normal nutrition, to say nothing of the newer superlative state. Scientific information has outdistanced the practical distribution and consumption of our important food adjuncts. This is particularly true of calcium.

Standards for calcium intake are based primarily on carefully observed complete balance experiments. Apparently the needs are greatest for lactating women, and are successively less for pregnant women, growing children and infants, and adults respectively. Allowing 50 per cent safety margin, the most widely recognized daily standard for calcium ranges downward from 1.4 to 0.68 grams. A rounded value of 1.0 gm. plus or minus 0.4 gm. calcium (expressed as elemental Ca), depending on

TABLE I

Certain Foods as Sources of Calcium

Food Item	*Retail Price* Cents	Per	*Serving Portion*	*Milligrams Calcium* Per 100 Gm.	Per Serving	*Per Cent*	*Cost to Consumer of Food Providing 1 Gram of Calcium (Cents)*
Dairy Products							
Milk, cows; whole, buttermilk, or skimmed	11.0	quart	1 cup (¼ qt.)	120	293	106	9.4
Milk, evaporated	7.0	14 oz.	½ cup	276	336	156	6.4
Milk, powdered	55.0	lb.	15 gm.	1,180	177	97	10.3
Cheese, American	27.0	lb.	15 "	933	140	156	6.4
Cheese, Cottage	15.0	lb.	55 "	82	.45	25	40.0
Cheese, soft cream	44.0	lb.	30 "	365	109	37	27.1
Cheese, Roquefort	179.0	lb.	15 "	706	106	17	58.8
Vegetables							
Beans, canned, string	10.5	19 oz.	130 gm.	48	63	24	41.7
Bean, soya, flour	17.5	lb.	40 "	271	108	70	14.3
Carrots, canned, diced	9.6	20 oz.	120 "	57	68	34	29.5
Peas, canned	12.0	20 oz.	70 "	16	11	7	142.9
Potatoes, white, boiled	35.0	15 lb.	150 "	16	24	31	32.2
Spinach, canned, cooked	12.0	18 oz.	100 "	65	65	27	37.0
Tomatoes, canned	5.0	10 oz.	130 "	8	10	5	250.0
Fruits							
Apples, fresh	5.0	lb.	1 large	7	11	6	166.6
Bananas, fresh	6.0	lb.	1 medium	9	9	7	142.9
Oranges, fresh	25.0	doz.	1 "	44	69	19	52.7

Meat, eggs, and grain products omitted because their calcium content is of lesser importance

specific circumstances, is a suitable mean value to bear in mind.

There are two important channels through which the public gets its dietary calcium: foods and pharmaceuticals. It seems unnecessary to enumerate the obvious reasons why public health ideals should call for most of the day-after-day calcium to be provided by foods rather than by pharmaceuticals—convenience, automaticity, distribution, and many others could be mentioned. Perhaps omission of the word *economy* appears to be an oversight. Perhaps it is thought that calcium salts are usually cheaper in the grocery than in the drug store. The data which will follow show comparative values.

What excuse, if any, exists in 1936 to justify the fact that many children still get insufficient calcium in their dietaries? Is it purely one of economic cost? Is there lack of either knowledge, initiative, perspective, or wise judgment on the part of those who shape our food consuming habits? Do not food producers, teachers, regulatory officials, public health bodies, and other active agencies all have a responsibility in improving this condition? Is the delayed improvement due to maldirected promotional efforts on the part of people either in or outside of direct sales work? Or is it reluctance to approach an old problem in a new way that continues to retard accomplishment of more ade-

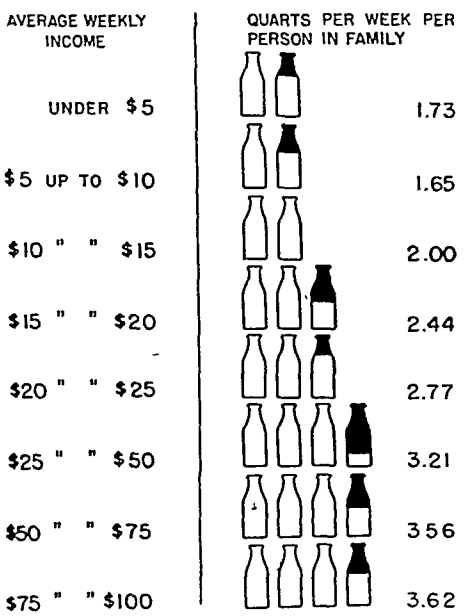
quate calcium intake? Answers to these points are not simple. Undoubtedly the points mentioned constitute only a part of the reasons.

Table I lists foods commonly regarded as important sources of dietary calcium. All of them convey other very significant nutritional values such as proteins, vitamins, calories, and minerals which have necessarily been omitted from this consideration. Nevertheless, the figures of the last column show the respective retail costs of different food items each in such quantity as to provide 1.0 gm. of calcium. Prices are based on Chicago retail grocery quotations as of September 16, 1936. Only one product listed was not available in the grocery stores—the powdered milk. It was available in most drug stores at the price indicated.

The cost of natural foods bearing 1 gm. of calcium varies from a low of 6.4 cents for cottage cheese up to more than $2 for evaporated milk or American cheese. Fresh whole milk is usually recognized as providing more calcium to the American dietary than any other single food. That is a position of extremely high respect and responsibility which milk holds. Evaporated milk is also an important food source of calcium and, like all other dairy products, its calcium is highly regarded for its biological availability. If milk consumption levels were actually and universally high, closely approaching a quart per capita per day, the situation would indeed be gratifying. In disappointing contrast, however, there stands the evidence as typified by a recent report. A survey of milk consumption [2] in 59 large cities of this country, conducted by the Consumers' Counsel Division of the Agricultural Adjustment Administration, U. S. Department of Agriculture, states:

3. In only 8 out of the 59 cities was the average per capita consumption of whole and evaporated milk 3 quarts or more per week. In 9 cities the consumption was less than 2 quarts per person. Less than 2 quarts per person also was reported for more than two-thirds of the entire number of families surveyed.

FIGURE I



In the May 18, 1936, issue of *Consumers' Guide* [3] the same agency has portrayed the observed relation of income, as well as the relation of number of children per family, to milk consumption. These are shown in Figures I and II respectively.

Let us now compare the foods with the calcium pharmaceuticals such as one might find in most good drug stores. Table II gives such values based on prevailing Chicago retail trade prices of the same date. Though that list is brief, it shows a typical cross-section of the relative costs of some of the calcium tablets and powders.

So much for the sources of dietary calcium as they exist today. A further

step is to consider what might be done on a widespread scale if and when a newer practice seems advisable. There are accessible in commercial quantities a number of strictly edible calcium salts. Data on the best known of these salts are given in Table III. They include the carbonate, citrate, gluconate, lactate, phosphate, and bone meal. Any of these calcium salts could be used to fortify foods. Some of them would probably be unsuitable in specific circumstances because of mechanical or chemical incompatibilities. Out of the entire list, however, there are many possibilities for practicable fortification of economical foods. For example, it might be a step in the right direction if such products as macaroni, spaghetti, noodles, bread, crackers, cereals either ready-to-serve or uncooked, and possibly other foods were moderately enriched with calcium at the manufacturing plant where calcium salts are available at relatively low costs. It is thought that the cost would be sufficiently low to permit the fortification without increasing the retail food price. The facts are that many children who receive too little of the high-calcium foods quite universally consume heavily

TABLE II

Calcium Pharmaceuticals, Usually Eaten for Special Dietary Purposes

Product	*Type*	*Form*	*Cost to Consumer of Pharmaceuticals Providing 1 Gram of Calcium (Cents)*
A	Bone phosphate	Tablet	1.4
B	Calcium phosphate	Powder	2.8
C	Di-calcium phosphate	Tablet	5.4
D	Calcium gluconate	Powder	3.6
E	Calcium gluconate	Tablet	17.9
F	Calcium lactate	Powder	0.8
G	Calcium citrate	Powder	0.9

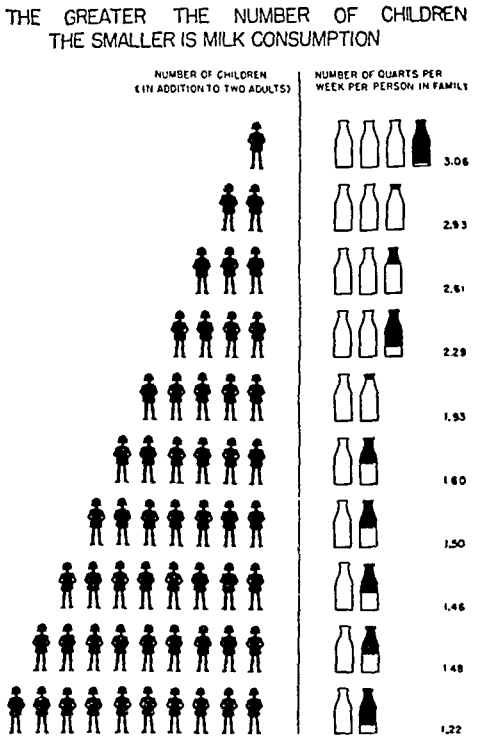
TABLE III

Calcium Salts of Strictly Edible Grade Are Available at Prices as Indicated Below

Material	*Cost per lb. (in Ton Lots) (Cents)*	*Per Cent Calcium in Salt (Approx.)*	*Cost of Salts to Food Manufacturer per 1 Gram of Calcium (Cents)*
Calcium carbonate (precipitated)	3.0	40	0.016
Calcium citrate	30.0	21	0.32
Calcium gluconate	50.0	9	1.25
Calcium lactate	21.0	13	0.36
Calcium phosphate, mono-	8.0	16	0.11
Calcium phosphate, di-	7.0	23	0.07*
Calcium phosphate, tri-	7.0	36	0.05
Calcium phosphate, bone meal	10.0	33	0.07

* If 5 per cent of this salt were incorporated in an inexpensive food, for example macaroni, retailing for 10 cents per lb., each pound of product would contain 5.38 grams calcium, and a gram of added Ca would cost the consumer 2 cents.

FIGURE II



of the inexpensive carbohydrate foods. *The reason is economic.* The question of relative nutritive values of various calcium sources requires further biological tests both with the calcium salts and with natural foods. In this regard Dr. Shohl [4] wrote recently that nearly all forms of calcium even including the insoluble salts seem utilizable.

In conclusion, the circumstances seem to indicate the need for more economical, automatic and accessible food sources of calcium. To some people it may appear that it is unfair to express the calculated cost of food calcium as it has been done above, since milk, for example, also furnishes liberally of relatively expensive food substances including high quality protein, fat, and vitamins. Another field of nutrition, namely, livestock feeding, serves as an interesting comparison. Many efficient livestock producers use milk in their rations, but for several decades they have based use of that product chiefly on constituents other than calcium. For an economical source of calcium they have used mineral salts *per se,* or bone meal. Perhaps the addition of calcium salts to certain foods which are consumed regularly by families on extremely low budgets would help significantly. They, in particular, are the people whose calcium needs are least adequately met.

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Burial Permits in Maryland

THE State Board of Health of Maryland, on April 22, 1937, adopted a regulation recognizing burial permits from the District of Columbia and states adjacent to Maryland. This action was based upon a feeling that the primary purpose of the burial permit is to give assurance that a death certificate has been filed with the proper local registrar.

It was further felt that a permit from an adjacent state will give this assurance about as effectively as would a Maryland permit; therefore, undertakers from such states will no longer be required to obtain a second burial permit when entering Maryland.

Cemetery authorities in Maryland will accept, record, endorse, and forward such foreign permits to the local registrar in the district of burial, in the same manner as is prescribed by law for Maryland permits.

Nature of Autarceologic Susceptibility to Poliomyelitis

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THE weight of evidence in poliomyelitis is to the effect that the upper respiratory (nasal) mucous membrane is the portal of entry of the virus. It is questionable, however, whether an intact mucosa actually constitutes the barrier to the paralytic disease in the majority of those exposed to the virus. A significant number of cases of the bulbar type following surgical procedures involving the upper respiratory mucosa indicate that its permeability may sometimes be a factor in the occurrence of the frank disease.[1] On the other hand, the phenomenon of widespread immunity among individuals who have not suffered an attack of paralytic poliomyelitis suggests that the virus must have reached some deeper structure.

Recently, Webster[2] has shown in mice with high inborn resistance to experimental encephalitis (St. Louis type) that in the sub-clinical immunizing infection following intranasal instillation, the virus had penetrated the nervous system as in frank disease, thus indicating that resistance in such strains of mice is not merely a matter of permeability of the nasal mucosa.

PREVENTION OF INFECTION BY INTRANASAL BLOCKADE

The permeability of the nasal mucosa may not necessarily determine the paralytic disease or sub-clinical immunization as the result of infection in man, though the virus may gain entrance at this point. Recent investigations have been concerned with chemical blockade for the prevention of poliomyelitis. In 1920, Flexner and Amoss[3] performed experiments with chloramine-T and dichloramine-T. In 1934, Olitsky and Cox[4] rendered mice resistant to subsequent infection by intranasal instillation of the virus of equine encephalomyelitis with tannic acid, and stated that they were also carrying on experiments with the virus of poliomyelitis. Armstrong,[5] in 1935, reported tests with sodium alum in the prevention of nasal infection in mice with the virus of encephalitis, and later[6] in monkeys with the virus of poliomyelitis. Sabin, Olitsky, and Cox[7] meanwhile projected their studies with tannic acid and sodium alum. Armstrong[8] subsequently used a number of chemicals and found picric acid most effective.

Due to variability of result by the intranasal route of infection in the monkey, the outcome has not always been clear-cut, but reports by various investigators with a number of chemical preparations indicate successful blockade by treatment of the nasal mucosa.

* This work was financed by the Harvard Infantile Paralysis Commission and the President's Birthday Ball Commission for Infantile Paralysis Research.

Read before the Epidemiology Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 22, 1936.

We have performed experiments with several chemical agents using *Macacus rhesus* monkeys, and in order best to take account of the wide variation in the frequency with which the disease results from intranasal instillation, equal numbers of control animals in each experiment.

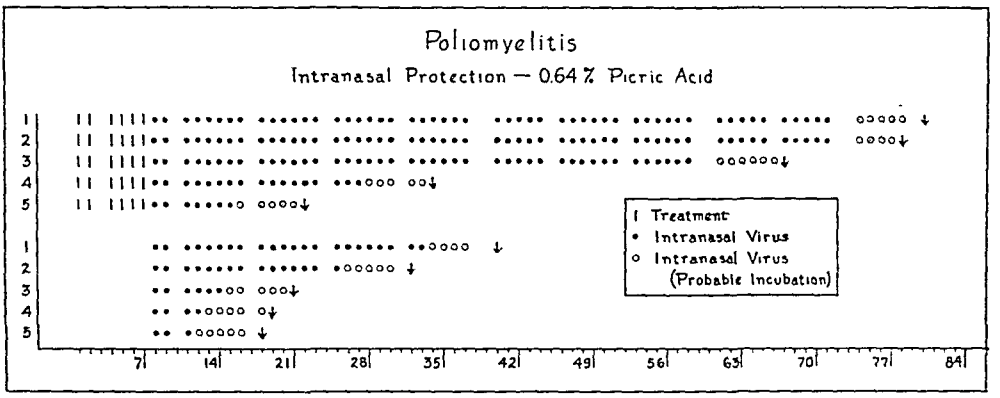
Alum 1 per cent—Five monkeys were given, for 3 consecutive days, 0.5 c.c. alum 1 per cent in each nostril, and on the 4th day one drop of virus in each nostril. This procedure was repeated until the 42nd day after the first alum instillation, when the treatment was discontinued. The virus was then given every other day while the animals survived. Five controls were given an equal amount of the same virus on the same days as the treated animals. One of the alum treated monkeys did not develop the disease until 83 days after the first instillation of virus; and one of the controls survived instillations of virus for 60 days before developing the disease. Three of the control and 2 of the experimental animals developed the disease within 10 days of the initial instillation of virus. The average length of survival in the 3 remaining experimental animals was 59 days; in the 2 remaining controls, it was 56 days.

Alum 4 per cent—Five monkeys were given, on alternate days, 0.5 c.c. alum 4 per cent in each nostril; and on intervening days, one drop of virus in each nostril. An equal number of controls were given the same amount of virus intranasally at the same time. One of the treated animals failed to develop symptoms after being given alum and virus for 150 days. At the end of this period, the monkey was inoculated intracerebrally and developed experimental poliomyelitis, indicating that even this large number of intranasal instillations, while failing to produce the disease, did not evoke immunity. In this experiment, one control survived intranasal instillations of virus for 121 days, then died of intercurrent disease. Four of the control animals developed poliomyelitis between 18 and 29 days, and 3 of the experimental animals between 15 and 30 days after the initial virus instillation. One experimental animal developed the disease after 112 days of alternate alum and virus instillations.

Tannic Acid—Ten monkeys were given on 3 consecutive days 1 c.c. 1 per cent tannic acid in each nostril, and on the 4th day one drop of virus in each nostril. This procedure was repeated on the one surviving animal up to the 40th day after the first tannic acid instillation, when treatment was discontinued; the virus was given every day thereafter. Ten control animals were given an equal amount of the same virus on the same days as the treated animals. Nine of the monkeys treated with tannic acid withstood an average of 3.2 instillations of virus; one survived 94 instillations, was inoculated intracerebrally, and succumbed. The controls all succumbed after an average of 4.2 instillations of virus. Thus, with one exception, the results in the treated animals were not essentially different from the controls.

Picric Acid—Five monkeys were given for 6 consecutive days 1.5 c.c. picric acid 0.64 per cent (in normal salt solution) in each nostril. On the 7th day a drop of virus was instilled into each nostril, and this was repeated each day until the animal developed poliomyelitis. Five controls were given the same amount of virus intranasally at the same time. All the animals in this experiment succumbed. Those treated withstood an average of 39.4 instillations of virus, the controls an average of 14.8 instillations. The average survival time from the initial instillation of virus was 49 days in the experimental animals and 19 days in the controls. Two of the experimental animals sur-

FIGURE I



vived no longer than the controls, the increase in survival time being accounted for by 3 of the experimental animals (Figure I).

Picric Acid with Glycerine—Five monkeys were given each day for 6 consecutive days 0.5 c.c. of a mixture consisting of 3 parts of picric acid 1.5 per cent (in normal salt solution) with 1 part glycerine, this being instilled into each nostril. On the following day they were given a drop of virus in each nostril, this being repeated daily. Five controls were given an equal amount of the same virus intranasally at the same time. Two of the treated animals withstood an average of 23.5 instillations of virus; the remaining 3 died of intercurrent disease, having survived 49, 51, and 62 instillations of virus, respectively. Four of the control animals succumbed after an average of 5 instillations; the 5th failed to develop the disease after 72 intranasal instillations of virus.

The results of our experiments corroborate those obtained by other investigators to the effect that blockade by various chemical preparations protects temporarily to a considerable degree against intranasal instillations of virus. However, it must be noted that here we are dealing with the application of what is perhaps a relatively huge dose of the infectious agent to the apparently normal and uniformly permeable nasal mucosa of a monkey. Furthermore, this structure in the monkey presumably is the barrier, since the production of neutralizing substance does not follow even a long series of ineffective instillations of virus. In man, however, the evidence of widespread immunity suggests that the occurrence of frank poliomyelitis hinges upon relatively minute doses of virus, and upon an exquisite susceptibility on the part of the exceptional individual.

Should mechanical measures prove successful in blocking temporarily the entrance of the virus, it should be borne in mind that sub-clinical immunization, which might stand the individual in good stead against some later exposure, probably would be prevented likewise. This may cause some question to be raised as to the feasibility of this procedure as a practical means of preventing the disease, for the reason that application to the general population might avert a relatively enormous number of sub-clinical immunizing infections for every frank case of the disease it prevented.

The practical difficulties in the way of mass application of specific measures in a disease in which infection is so widespread and the paralytic disease

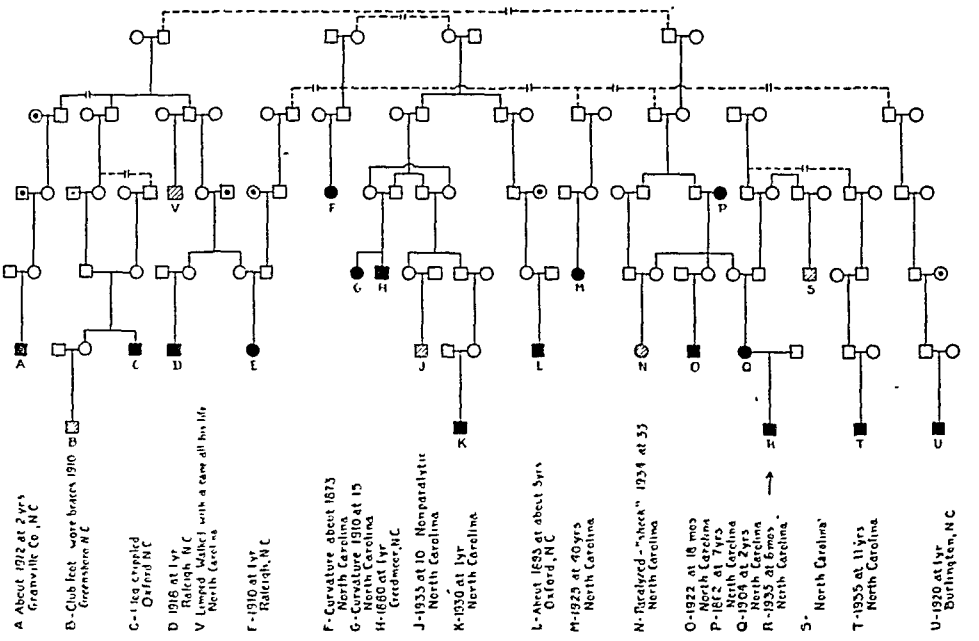


FIGURE II—Cases of poliomyelitis in a single family line. Case R is the propositus. The individuals indicated by small dots represent families into which members of this family married and in which there were cases. Cases as determined either by examination or history are shown in black, more doubtful cases are shaded.

so exceptional have been discussed previously and the importance of autarceologic susceptibility emphasized. An understanding of the basic factors which determine susceptibility might lead to a practical means of its correction in the few, or to a means of selection of that minority in the population who lack resistance, for whom specific measures or even continuous medication might be feasible.

Clinicians have long been cognizant of the tendency of poliomyelitis to occur in children who are large, healthy, and well nourished. Such notations as the following are found scattered through the literature:

"I have seen it in others who are older and the finest children" (Underwood 1799).

"Strong and healthy children are more frequently affected than those of a weakly constitution" (Shaw 1823).

"Among features prominent in almost every case was the strong and blooming bodily constitution of the patient" (von Heine 1840).

"The affection usually occurs in a strong, healthy child between 6 months and 2½ years old . . . A healthy looking boy, with light hair, blue eyes and sound teeth . . . The excellent state of the general health in this affection is very striking . . . Almost all of the children who are brought to our clinic are remarkable for their fine, healthy appearance" (Sinkler 1875).

"Boy, 3 years, stronger than his brother a year or two older . . . Boy, 3½ years, most active of a family of 3 children" (Caverly 1894).

"Of the 46 cases in which the previous health of the sufferers is given, it is quite certain that the strong, healthy children preponderated" (Caverly 1896).

"A perfectly vigorous boy until a fortnight previous . . . Four years old, a fine vigorous boy . . . A robust boy aged 2 years and 5 months . . . A healthy girl of 10 years and 6 months" (Madison Taylor 1898).

"As a general rule the children affected had been exceptionally robust and active with good appetites and living on a general diet" (Hill 1909).

These exclamatory comments concerning the children attacked by polio-

myelitis, appearing even in the earliest descriptions of the disease, presage Draper's "poliomyelitis type" and are enough to convince one that, whatever the individual predisposition, it does not reside in a "run down" condition in the ordinary sense of the word. Our own efforts toward defining more clearly the phenomenon of autarceologic susceptibility have been directed along 3 lines: (1) epidemiologic and genetic considerations, (2) anthropometric studies of individuals attacked, and (3) experimental attempts to influence the susceptibility of monkeys.

EPIDEMIOLOGIC STUDIES

Studies of the seasonal and geographic distribution [9] of poliomyelitis, in the face of what is evidently a widespread and relatively uniform dissemination of the virus, indicate a selectivity in its occurrence according to climate and season, and suggest that autarceologic susceptibility is associated with some failure on the part of a certain fraction of individuals to make adequate physiologic adjustment to varying climate and season. A hereditary influence on susceptibility is indicated by the results of a survey in which 51 per cent of cases gave a history of poliomyelitis among relatives, compared to 5 per cent of normal individuals.[10] This study was conducted in New England, an area of comparatively high poliomyelitis prevalence. In Figure II is shown the familial occurrence of the disease in a southern state, where the reported prevalence is low.

ANTHROPOMETRIC STUDIES

Several attempts have been made to confirm the clinical impression that poliomyelitis occurs in a certain type of individual suggestive of endocrine difference, but difficulties have been encountered in establishing a mathematical correlation between the disease and any measurable manifestation of endocrine anomaly. In a general way, the type is suggestive not so much of a pathologic endocrinism as an inherent or latent endocrine difference which may express itself only in certain differences in growth and development, which in themselves can hardly be considered abnormal from the endocrine point of view. Some studies relating to the type of individual prone to poliomyelitis have dealt with anthropometric measurements or with markings which have not been established as reflecting differences in constitution.[11]

We have made a series of anthropometric studies upon 109 poliomyelitis patients. Among the measurements, which are taken as indicative of endocrine differences suggestive of either a relative hyperpituitarism or a relative hypergonadism, are span (arm length), lower measurement (leg length), and upper measurement (body length). These figures have all been plotted with reference to age. They show increased span, increased lower measurement and decreased upper measurement as compared with the normal. Figures III and IV show the span in girls and the lower measurement in boys in this series, as compared with the normal variations for whatever ages, as shown by the unbroken lines on the charts. The changes in the other measurements referred to are of the same order as those shown in these charts.*

EXPERIMENTAL

In 1929, we attempted procedures designed to alter artificially growth and development in the experimental animal, in the direction indicated by clinical studies. These experiments, relating to

* The normals are those given by Engelbach, W.: *Endocrine Medicine*, Vol. I, Ch. 7, 1932, C. C. Thomas Co. A criticism of our observations lies in the fact that the normals which we used for comparison were not obtained at the same time and in the same locality as the cases.

FIGURE IV

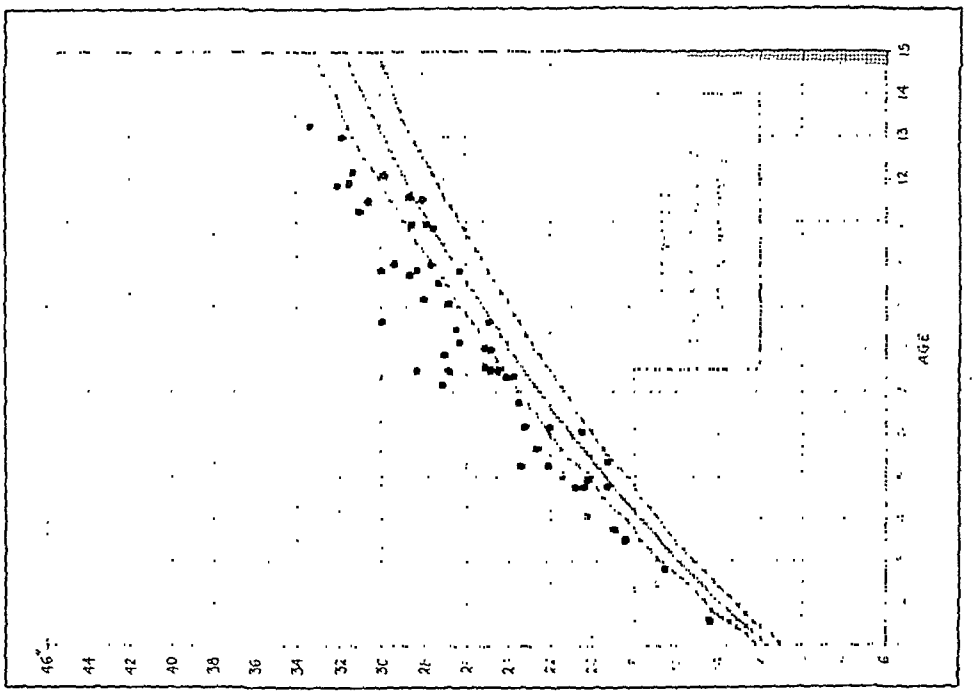
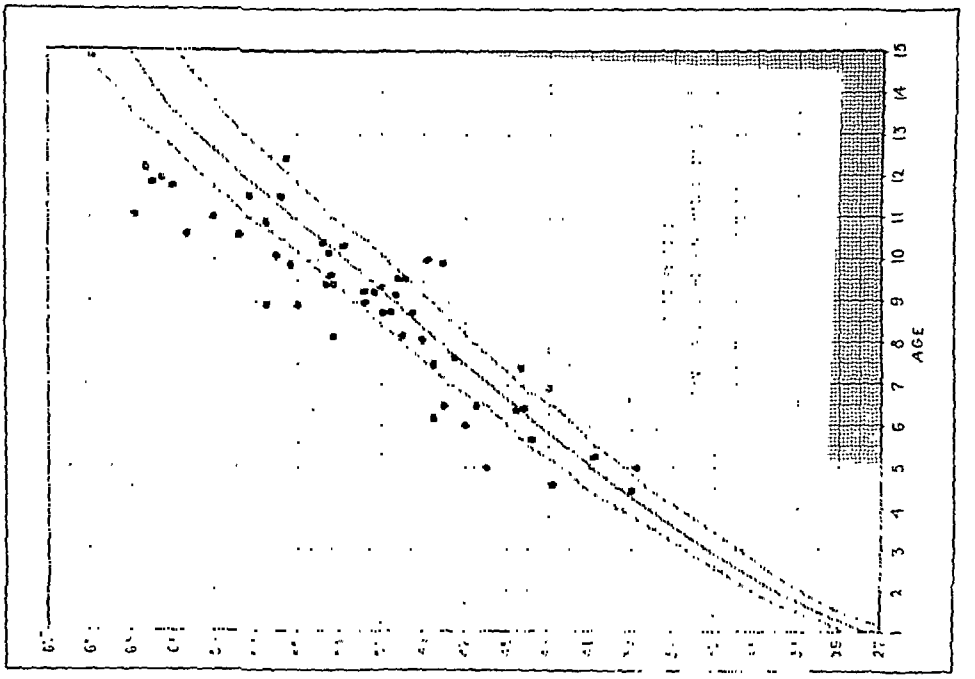


FIGURE III



thyroid and hypophysis, gave inconclusive results and were not published. More recent developments in the field of endocrinology—thinning of the vaginal mucosa by castration and recornification through administration of estrin, the finding that changes of similar origin occur in the vaginal mucosa during pregnancy, and more especially the participation of the nasal mucosa and other structures of ectodermal origin in these changes—are consistent with the aggregate information available concerning individual susceptibility to poliomyelitis: the type of person involved, the occurrence of the disease during pregnancy, and the tendency to familial occurrence.

With these considerations in mind, immature female monkeys were castrated. After 24 days, the animals were treated daily with intramuscular injections of 2,000 International units of estrin in oil (Squibb's Amniotin)* and then given intranasal instillations of a 5 per cent suspension of poliomyelitis virus. An equal number of castrate monkeys, not treated with estrin, and given intranasal instillations of the same virus at the same time as the estrin monkeys, were used as controls.[12]

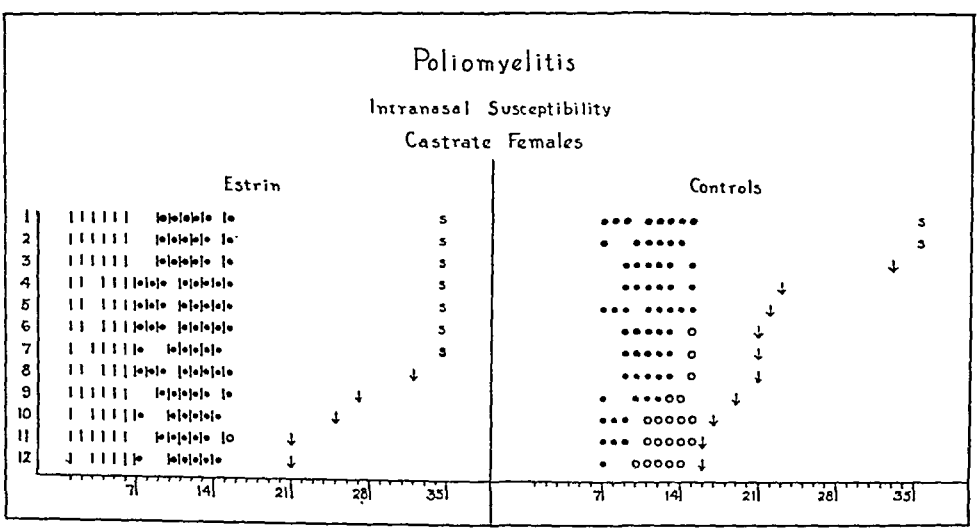
The results of 3 separate experiments are combined in Figure V. Seven out of 12 treated animals survived intranasal instillations of virus; in 5 of these, the average incubation period was longer than in the 10 control animals which developed the disease.

SUMMARY AND CONCLUSIONS

There is epidemiologic evidence that the virus of poliomyelitis is widespread, infection resulting in the production of humoral antibodies in the majority and the paralytic disease in the relatively small minority of individuals. The evidence indicates that, although the human nasal musoca is the point of entrance of the virus, its permeability may not determine the paralytic disease. On the other hand, the nasal mucosa of the monkey appears to be the barrier, since those animals which do not develop the experimental disease, even after a large number of intranasal instillations of virus, likewise fail to develop humoral antibodies. The seem-

* Supplied through the kindness of Dr. J. F. Anderson of E. R. Squibb & Sons.

FIGURE V



ingly paradoxical increased susceptibility in the monkey may of course be due to the fact that, compared to what must be the case in the human, the experimental animal receives massive doses.

Our experiments concerning chemical blockade confirm the findings of other investigators. It is questionable, however, whether the procedures applied to the experimental animal would be effective in that small fraction of the human population who are exquisitely susceptible to paralytic poliomyelitis.

Epidemiologic and clinical studies indicate that autarceologic susceptibility to the paralytic disease on the part of the few who develop the frank form on exposure to the virus is due to inherent and often familial endocrine differences, not pathologic in themselves but suggestive of pituitary gonad imbalance. Experiments are reported which indicate that susceptibility to intranasal infection in the monkey has been altered by castration and administration of estrin.

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Function of the School in the Rural Health Program*

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A RURAL community by its very nature offers unusual opportunities for building effective relationships between the school and community health agencies in matters of child health. That we are only now beginning to realize what may be done is due more to neglect than to insuperable difficulties.

Today many educational leaders are seeing a better future for the rural school. Curriculum revision committees are active in some states, new educational values are being emphasized; and health workers are being called upon to contribute to the expanding program. It seems particularly fitting that we should consider some of the constructive ways in which the school may participate in the rural health program for the benefit of its children, and the part health workers may play in stimulating and assisting the schools in this task.

MAKING THE SCHOOL HEALTHFUL

Since the school is a miniature unit of society, where experience in community living takes place inevitably and naturally, its most important function is to provide opportunities for, and encouragement of, healthful living throughout the school day. It should strive for the optimum development of each child, and should attempt to give him an understanding of health principles at his level of comprehension. Trite as these statements seem, they are in truth the very essence of a sound school health program. In actual rural situations the ability to make them function rests largely with the teacher. To her we must turn with help and stimulation, in order that her efforts may be intelligently and effectively applied.

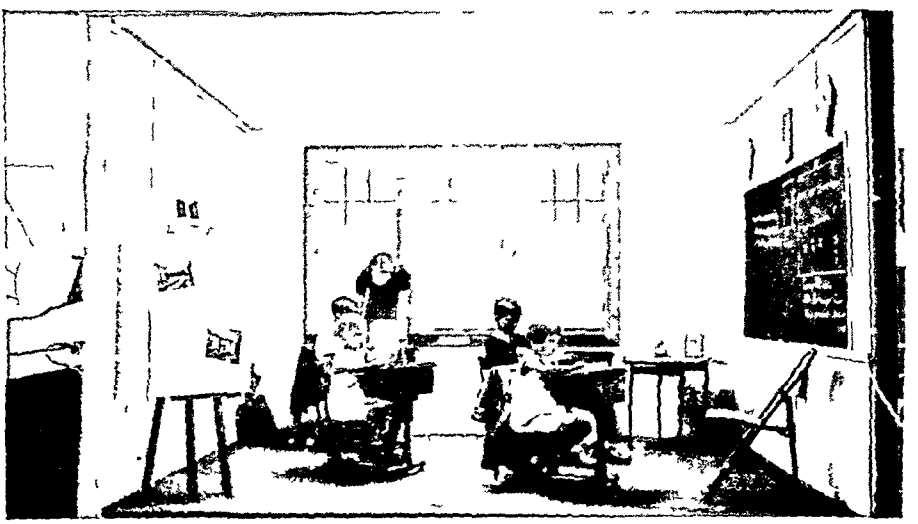
A 2 teacher school comes to mind where in the upper grade room a study of community living was undertaken. Major interests centered around community relationships, sanitation, home arrangement, and electricity. Several subject matter fields, including science, social studies, and art were utilized, and the work was carried out through committee activities. Among the activities of the committee on relationships was an interview with the county nurse, who outlined her work and that of other members of the health department. The report of the committee contained a summary of this interview and observations on the ways the health department had helped the local community. The committees on home arrangement and sanitation made booklets to illustrate their points, which included

* Read at a Joint Session of the Public Health Education and Child Hygiene Sections of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 24, 1936.

adequate lighting, drainage, and home decoration. Much enthusiasm was shown by the committee studying electricity and its uses. Several homes had just been wired, and the possibilities of electricity in cooking, housekeeping, and farming were fascinating to consider. Of special value from the health angle were the demonstrations of safety in the uses of electricity.

But was health functioning in the school itself? Certainly the harmonious working together of committees of children around common problems of interest was providing invaluable experiences in social living. The room itself, with its attractive cleanliness corner, its light colored, dull finish paint, electric lights, sanitary toilets, and general appearance of tidiness, was conducive to good living. One had but to observe the friendly atmosphere in the room, the participation of all children in play, the prevalence of milk and fruit in the lunches, the sharing of responsibilities in keeping shades adjusted and room ventilated, and the running water system of handwashing, to realize that healthful living was a part of the daily experience of the majority of children in this school. It is true that few schools have gone as far as this one, but it exemplifies what may be accomplished under intelligent teacher leadership.

There are numerous ways in which the school, individually or collectively, may focus community attention on its health problems. For example, the schools in Cattaraugus County, N. Y., recently capitalized on the growing interest in rural electrification by setting up at the County Fair an exhibit of a model rural schoolroom to show good lighting. The room, constructed in a booth approximately 12′ x 12′, was complete in every lighting detail. Windows, with adequate space in relation to floor area and double mounted shades, were realistically painted on one wall. On another was a blackboard painted a dull finish. The walls were two shades of soft, dull green, and the ceiling a dull white. Suspended from the ceiling was a semi-indirect electric light of an approved type, and in the room were 4 movable and adjustable seats. During the busy part of each day, shifts



County Fair Exhibit of Lighting in a Modern Rural School

of teachers and pupils carried on actual school work in this model room. In the adjoining booth the Home Bureau had a convincing exhibit to show contrasts between good and poor lighting in the home. Every school trustee in the county was sent an invitation by card to visit the school display, and the response was gratifying. A follow-up was made at the fall teachers' meetings and, although it is too early to see tangible results, it is hoped that some will soon be in evidence.

THE SCHOOL AND THE HOME

It has been said there is little hope that the school can bring about any appreciable change in home conditions which will better the life of a child while the child is in school. Such a statement is only a challenge to many. A well known rural educator, Dr. Fannie Dunn, has recently pointed out that:

> . . . the rural home and family still carry the major responsibility for the healthful living of their members. Of this responsibility the rural child bears a genuine and significant part. To the son or daughter in the rural home fall the chores of filling the woodbox, or caring for the stove or furnace; a share in the milking and handling of milk utensils; the bringing of water, disposal of garbage, and other tasks in maintaining sanitary surroundings; assistance in food preparation and serving; much responsibility for younger children; help in care of the sick and the aged.

The rural school through its program of living and learning may do much to prepare the child for his responsibilities in the home. In a school where hygienic practices are a daily occurrence he may gain experiences which will influence his life outside, and the living of his whole family.

A more satisfactory condition exists, however, when there is also a direct relationship between the school and the home. This may be the friendly, personal relationship between the teacher and the home, where around the kitchen stove Tommy in all his aspects is discussed, or it may be the relationship that grows out of a mothers' club or other parent group organized by the school.

Many health workers have seen complete transformations in a community as a result of the activities of an awakened parent organization. Such a group can create favorable attitudes toward the care of children, as well as toward health work in general. They can often give tangible assistance, such as supplementary funds for defect corrections, when occasion demands. One is impressed with the strength of these organizations in sections of such states as Tennessee and Virginia.

A health officer in Michigan once remarked that he always liked to have a new health department activity, such as an immunization campaign, preceded by special studies of the problem in the schools. If one could carry this idea further to include parent participation in the planning and carrying out of such a campaign results would be even more far reaching.

THE SCHOOL AND THE COMMUNITY

In its broader relationships with the community at large the school is only now beginning to sense its possible contributions. Exploited as it has often been by special interest groups, who find it an easy mark for propaganda, and sometimes intimidated by local politics or friction, the school has perhaps been a little slow in identifying itself with worth while community movements. In the community health program of rural areas, however, there is potentially an unusual opportunity for service which may be closely related to child needs.

In one rural county, where crops for cattle have frequently taken precedence over vegetable gardens for children, a

joint project to promote gardens has been undertaken by interested groups, including the schools. Focusing attention on low income families with children, an attempt was made to provide these families with seeds at low cost, and to give them help in planting and storing the vegetables.

Coöperating agencies included the Rotary Club which advanced money for the seeds; the county public health nurses and the agricultural teachers in village high schools who located needy families and gave out the seeds; the Home and Farm Bureau agents who supervised their distribution and later sent out literature on planting and storing vegetables; and the rural teachers who promoted the idea of gardens and good nutrition in their local communities. To assist the teachers in this task literature was made available to them from the offices of the Home Bureau and the School Health Service. Some teachers approached the problem from the standpoint of ample food supplies for school hot lunches, and in the fall worked out projects with their older children on canning and storage of foods for the lunches. Several of the agricultural teachers arranged to have the seeds used in 4-H Club garden projects for children in these needy families.

Many teachers of secondary schools are seeking ways of helping adolescent students to take part in socially significant work outside the school. Health departments could do much to encourage this tendency by offering assistance in making surveys of health department activities, water supplies, housing, and the like, and by providing simple tasks in which especially interested students might participate. In a high school in Illinois, senior girls, selected because of their ability and interest in health, assist the school nurse in clerical work, weighing, and similar tasks. Likewise, in rural areas such students could help the county or district nurse by making layettes, by doing simple office or clinic work, by talking up immunization programs in their neighborhoods, and by many other little services an imaginative nurse could help them plan.

It is evident that each rural community must work out its own way of joining forces for the improvement of child health. In general, there are certain forms of assistance from health agencies which most schools need and welcome. Briefly summarized they are: adequate health service, information on home conditions which will throw light on school problems, help in selecting sound health literature, help in locating health problems that need attention, information on health services available in the community, in-service training of teachers, and stimulation for continued activity. The schools, on the other hand, by focusing their attention on health activities which will aid the growth of their students, both as individuals and as members of the community, will be contributing their full share in a community health program.

A Modern Concept of Education*

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IN this age of conflicting viewpoints in contemporary American education, it behooves one to study carefully and analyze critically the leading philosophies of education. Only by this process is it possible to evaluate theories. Only by this process can one develop an individual workable philosophy of education, and today as perhaps never before one desperately needs a scale of values in the form of a definite, yet flexible, philosophy of life as well as education.

Consider briefly the 3 outstanding, yet definitely conflicting, viewpoints in education. Examples of each of these are continuously before you in any of our public schools. Their exponents, each in his own way, are loyal and devoted to their own cause.

1. *Traditional education,* said to be "subject-matter centered," looks to the past for its ideals and content. It maintains its identity through an effort to "conserve and transmit the heritage of the past." Its method is the logical organization and presentation of subject-matter. One learns the names of the bones of the body in hygiene, and the dates and battles in history. Though it may have fitted its followers to live in a static society, it is claimed that in the new social order it ineffectively prepares one for the solution of problems and continuous adjustment to change.

2. *Scientific education,* which is "adult" or "society-centered," made its entry half a century ago through the medium of psychology, tests and measurements, and experimentation. Preparation for life is its justification and it seeks to determine what is to be taught in the public schools through a careful consideration of the needs of the present. Job analysis is its favorite technic. Its most awkward task has been an attempt to measure the abilities of students and homogenously group them in Sections A, B, and C for instructional purposes—forgetting that these same youngsters in life must hold their own in business and society that are heterogenous.

3. *Progressive education,* which is called "child-centered," holds that the teacher should be a guide, whose duty it is to observe the spontaneous activities of children, and to study their mental and emotional reactions. Content and activities are selected to further the immediate purposes of children. Experience in meeting new situations prepares for future needs. Living fully and purposefully today gives practice in meeting situations later in life.

Though relatively new in the American system of education, the progressive education movement is based upon the philosophy of Rousseau, Pestalozzi, Froebel, and Tolstoy. Its greatest lia-

* Read before the Public Health Education Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

bility is that all teachers are not artist-teachers and all school situations are not ideal. Its emotional appeal is tremendous and many converts have caught the spirit, but as yet few have developed the technic.

By cross-breeding, Burbank was able to develop superior fruits and flowers and cactus plants. Likewise, because in almost every modern school can be found devotees of each of these 3 conceptions, a new specimen in education is developing. A synthesis of the best in these 3 philosophies is gradually evolving. A new concept is emerging, characterized by the stability and ideals of the traditional; the accuracy and skills of the scientific, and the spontaneity and creativeness of the progressive.

From the traditional school we adopt certain ideals and standards of belief and conduct, such as coöperation, respect for law, regard for the other fellow's rights and feelings, honesty, trustworthiness, and thrift. We could borrow from that school too, loyalty to family, church, government. John Dewey told us in his last book that one of the underlying causes of chaos and unrest so characteristic of civilization the past decade was the loss of our loyalties—a person without loyalties is like a ship without an anchor.

From the scientific school we get the idea of basing the curriculum upon problems individual and social that are current today. We must measure progress too and provide for skills. L. P. Jacks, in his *Education of the Whole Man* tells us that the greatest undeveloped asset of the American people is skill. We cannot overlook such a shortage as that.

From the progressive school we borrow the idea that content and activities should be selected because of their inherent significance to pupils—even traditional subject matter becomes tremendously interesting if it relates definitely to the problem at hand. We agree that experience in meeting some need in a new and better way is a preparation for meeting the same kind of need in the future, but it is difficult to plan for the development of all the powers and needs of children through the medium of large experience units.

Writing in September *Parents Magazine,* Hughes Mearns, child expert, gives us a word picture of the new concept:

> The old answer was scholarship. The new answer is that scholarship is not the most important aim of youth education, but personality growth rather, and social growth.
>
> The old education was for the few, and it was sedentary; the new education is for all and it is active; ability to do is almost as worthy now as ability in knowing.

Rollo Reynolds, Principal of the Horace Mann School, goes further and outlines the responsibility of the newer education when he tells us that the great American public schools should do just 4 things for the 29 million school children—should develop in them 4 powers—the power to do, the power to know, the power to feel, the power to think.

Simply stated, and in the words of Thomas Briggs, the new concept proposes that "education should attempt to guide young people through experiences that will maximally develop each one to do better than he otherwise would or could those desirable things that he will do anyway."

The new theory holds that the values of education must be measured by its contribution to the most effective living. Formerly the criterion was college entrance requirements!

What prepares one for effective living? What is fundamental to the development of the whole child? What is essential to personality growth and social growth?

1. Of first importance is the adequate understanding of child nature. Every child has certain fundamental needs which are essentially like those of every other child. They are simple; it is relatively easy, but of tremendous importance if personality development is our aim, for every teacher to provide for each child to succeed at some task reasonably often. Units of work based upon life situations give opportunity for exploration, curiosity, and zestful activity. Self-respect is dependent upon recognition and approval. School is a social situation—children work together, play together, and learn to live happily together.

Children also have many characteristics which distinguish them from other children—marked differences in capacity to learn, in interests, in habits, skills, appreciations, and attitudes. The modern school preserves these differences realizing the violence done to individuality and personality when children are standardized as though they were run through a mill. Individual differences may take on another meaning also—the right to be different means the right to think for one's self—the right to make decisions—to become self-directing, to be responsible for one's conduct, one's work and one's relations with others.

2. The school environment contributes largely to the development of personality. Physically the environment should be comfortable, attractive, free from strain and menaces to health. Mentally it should be stimulating, satisfying, and interesting. Socially it should provide for working together on tasks that are mutually interesting—a sharing experience. And emotionally the school should be free from fear, harsh discipline, excessive noise and excitement, and too much emphasis given to competition. There must be pupil-teacher rapport for only through this happy and constructive relationship can there be spontaneity and creativeness.

3. The modern concept of education demands that we modify or change outright the curriculum. Many of the traditional subjects which aimed at training the mind and preparation for college entrance are either easing out of the curriculum or attracting fewer adherents. An attempt at enrichment and preparation for vocations and leisure have brought many contributions such as public school music, art, dramatics, health, physical education, family relationships, home management, cooking, sewing, manual training, and many others.

There is today a distinct tendency to break down subject-matter and to organize units of study around present-day problems or interests of the children. It is held that more subject-matter will be used by this process and that skills, abilities, understandings, and appreciations would even more effectively be accomplished by virtue of the interest children feel in pursuing their own goals.

If education, however, is to be afforded by a series of experiences—these experiences must be organized in some way to indicate their contributions to development; to facilitate learning: retention, skills and to show relation of one experience to others and eventually to a unified whole.

The teacher sets the stage and remains in the background in such a learning-situation. Through this process there is more learning and less teaching; more study and activity and less recitation. Pupils are guided in the solution of vital problems of individual and social life.

Certain Factors Affecting the Growth of Food Poisoning Micrococci*

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THE increasing number of food poisoning epidemics which are traceable directly to preformed toxins produced by certain species of micrococci (staphylococci) have caused health officers to take notice of this type of gastrointestinal upset. Little information is available on the general characteristics of these organisms other than the work of Dack *et al.*[1] and others who have studied in part the cultural characteristics of the micrococci responsible as well as the factors associated with their toxin production.

Stone[2] has reported that all of the micrococci associated with food poisoning epidemics have one cultural characteristic in common, namely, gelatin liquefaction. It has been known for some time that a large percentage[3] of micrococci liquefy gelatin and particularly the *Micrococcus aureus* types which are usually encountered in gastrointestinal upsets traceable to toxin producing micrococci. Stone has reported that a special medium prepared by drying the gelatin before making up and increasing the amount of beef extract from 0.3 per cent to 3 per cent, will produce a medium which micrococci will more frequently liquefy than the commonly used medium with 12 per cent gelatin and 0.3 per cent beef extract.

A study (Table I) of the relative rapidity of gelatin liquefaction as compared in ordinary nutrient gelatin and Stone gelatin indicates that toxin producing micrococci are somewhat more active from the standpoint of gelatin liquefaction in Stone's gelatin than in the more commonly used nutrient gelatin. Certain strains, particularly Nos. 8, 42, and 135, originally received from Jordan, were very slow liquefiers of ordinary nutrient gelatin but in Stone's gelatin liquefaction was much more rapid, while there were a few strains of Stone's gelatin in which liquefaction was slower. Repetition of these tests indicated that the rapidity of gelatin liquefaction is a very valuable character of the toxin producing micrococci. Certain other factors are involved in controlling the rapidity of gelatin liquefaction and as a cultural character it is not particularly suitable for differentiating the toxin producing type as a group.

The drying of the gelatin probably plays little part in increasing the efficiency of Stone's medium, but an increase (Table II) in the percentage of meat extract was found to increase the rate of gelatin liquefaction. Experiments in which varying amounts of beef

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TABLE I

Relation of Standard Gelatin and Stone's Gelatin to Time of Liquefaction

Culture Number	Number of Hours First Liquefaction Was Noted: A.P.H.A. Standard Gelatin (1907)	Number of Hours First Liquefaction Was Noted: Stone's Gelatin	History of Cultures	Source
B2	24	24	Illinois State Department of Health	Milk
*3	..	..	Lister Institute	Cake
*8	2,080	48	University of Chicago	Cake
*9	24	24	Lister Institute	Chicken gravy
*42	2,080	48	Lister Institute	
*95A	48	24	University of Chicago	Cream filled cake
*95B	24	48	National Institute of Health	Cream filled cake
*95C	24	24	Lister Institute	Cream filled cake
*135	2,080	912	Lister Institute	Infected compound fracture
*137	48	912	National Institute of Health	Abscess on thigh
173E	24	24	U.S.D.A.	Cream pie filling
35,556–B7	48	48	U.S.D.A.	Pickled tongue
35,556–B9	24	48	U.S.D.A.	Pickled tongue
35,556–B13	24	48	U.S.D.A.	Pickled tongue
35,556–B14	24	24	U.S.D.A.	Pickled tongue
49,711–B1	24	912	U.S.D.A.	Cream filled pastries
49,711–B2	24	48	U.S.D.A.	Cream filled pastries
49,711–3P7	24	48	U.S.D.A.	Cream filled pastries
49,711–3P12	24	..	U.S.D.A.	Cream filled pastries

* Strains originally obtained from Dr. E. O. Jordan

extract from 0.7 per cent to 3.0 per cent were used has shown that in most cases a gelatin which contains 2 per cent or more beef extract was more susceptible to liquefaction by the toxin producing micrococci than one with smaller amounts. These observations could not be confirmed in all cases, as the organisms varied somewhat in their rate of gelatin liquefaction with increased amount of meat extract.

It will be noted that the onset of liquefaction was exceedingly slow for many of the strains. It is debatable whether an organism which takes nearly 3 months to begin liquefaction should be considered as a liquefier in the same sense as other strains which produce demonstrable liquefaction in relatively few hours.

The toxin producing micrococci appear to be ubiquitous in nature. They are found in many sources and may be prevalent in many types of food. A study of the udder flora of over 7,000 cows shows that over 20 per cent discharge an orange liquefying micrococcus similar in cultural characteristics to the toxin producing types. However, there was no evidence of toxin production judged by effects on the consumers of their milk. A study was made of 32 chicken pies served at public suppers, in which relatively accurate information was available as to any effects of preformed toxins. In all relatively large numbers of orange liquefying micrococci were found but no evidences of gastrointestinal disturbances were noted in any of the consum-

TABLE II

Effect of Per cent of Beef Extract Upon Liquefaction of Gelatin by Food Poisoning Micrococci

	Number of Hours First Liquefaction Was Noted in Increased Percentages of Beef Extract			
Culture No.	*0.7*	*1.0*	*2.0*	*3.0*
B2	48	24	24	24
3	..	..	..	..
8	1,400	1,400	144	144
9	168	168	48	48
42	1,400	1,400	240	144
95C	24	24	24	24
95A	168	48	24	48
95B	336	168	168	48
135	2,080	2,080	2,080	720
137	336	336	144	240
173E	168	48	24	48
35,556–B7	1,200	720	48	48
35,556–B9	168	48	24	24
35,556–B13	168	168	144	48
35,556–B14	336	168	144	144
49,711–1	1,200	720	144	144
49,711–2	960	48	144	48
49,711–3P7	1,400	720	144	48
49,711–3P12	168	168	48	48

ers. These micrococci were identical with the toxin producing types with the exception of the toxin producing property. It is apparent either that the toxin producing types are widely distributed in nature requiring conditions favorable to toxin production, or our present cultural reactions are inadequate for their identification.

If these types are so apparently widespread and in most instances retarded in their ability to produce toxin, information is necessary as to the factors which might inhibit their development in food when present. Certain ingredients in prepared foods are known to have an inhibiting effect on the growth of organisms. Information is lacking on the effect of these substances on the growth of toxin producing micrococci. A study was made (Table III) of the effect of sucrose upon these organisms and the minimum amount which must be present to inhibit their growth. Increasing amounts from 20 to 50 per cent sucrose were added to veal broth which was subsequently heavily inoculated with 2 standard strains of toxin producing micrococci then incubated at 37° C. for 18 days. The toxin producing micrococci developed in relatively high concentrations of sucrose. For the first 24 hours. growth was vigorous in concentrations

TABLE III

Effect of Sucrose Upon Growth of Food Poisoning Micrococci

Culture	*Time of Incubation*	*Number (million) Organisms per c.c. in Increasing Percentages of Sucrose*							*Number of Organisms (millions) in Inoculum*
		20	*25*	*30*	*35*	*40*	*45*	*50*	
95	24 hours	1,790	5,190	2,500	1,570	1,300	2,340	3,090	28
	48 hours	3,070	2,420	3,180	1,890	1,780	2,530	2,890	
	5 days	3,920	6,400	3,120	52	601	410	348	
	14 days	15	970	1,930					
	18 days								
42	24 hours	1,920	2,570	2,850	2,160	3,950	3,030	2,930	476
	48 hours	3,570	3,580	3,100	3,290	1,780	2,640	2,280	
	5 days	5,000	6,000	255	2,640	3,100	14	113	
	14 days	5,200	710	16	91	1,090			
	18 days			93					

as high as 50 per cent. During the second 24 hours, growth was materially checked in the higher concentrations although no decided reduction in number was apparent. At the end of 5 days, the numbers of micrococci were materially reduced, probably not through the action of the high concentrations of sugar alone, but due in part to the presence of the acid developed in the medium. Repeated observations showed that from 5 until 18 days the number of organisms in the higher percentage of sucrose rapidly decreased. In a medium containing 35 per cent of sucrose or more the organisms were practically all inhibited or killed at the end of 18 days. At the end of 14 days it was found that 20 per cent of sucrose broth was sufficient to reduce materially the number of organisms. The acid produced by the organisms in the medium is not an important factor in itself, in this case, as an increased amount of sucrose did not increase the amount of acid formed. The amount of acid produced was as great in the lower as in the higher concentrations. The combined action of the acid and sucrose may have been responsible for the reduction in number of viable micrococci in the flasks containing the larger amounts of sucrose.

Similar experiments were carried out with various concentrations of sodium chloride. It was noted that the toxin producing micrococci are somewhat resistant to all concentrations of sodium chloride up to and including 12 per cent, although in concentrations as low as 6 per cent growth was materially inhibited as compared with the controls containing no sodium chloride. It is no doubt difficult to obtain sufficient practical concentration of sodium chloride foods to inhibit definitely the growth of all the cells contained in cultures of toxin producing micrococci. Sodium chloride appeared to have no killing effect, as the numbers after 48 hours' incubation remained approximately constant through the 18 day incubation.

Similar experiments were done using various amounts of acetic acid as the inhibiting agent. Veal infusion containing as a minimum 0.05 per cent and increasing to 0.25 per cent was prepared and inoculated with 2 strains of toxin producing micrococci. It was found (Table V) that acetic acid has a very definite inhibiting effect. Concentrations as low as 0.05 per cent materially reduced the growth rate below that found in the control containing no acetic acid. Concentrations as low as 0.15 per cent at the end of 48 hours brought about a decided reduction in the number of organisms, while at the end of 7 days, media containing 0.2 to 0.25 per cent were practically free of organisms. In contrast to the effect of sucrose and sodium chloride, acetic acid had an inhibiting effect in low dilutions and a definite killing effect in higher concentrations.

TABLE IV

Effect of Sodium Chloride Upon Growth of Food Poisoning Micrococci

Culture	Time of Incubation	Number (million) of Organisms per c.c. Found in Increasing Percentages of Sodium Chloride							Number of Organisms (millions) in Control
		6.0	7.0	8.0	9.0	10.0	11.0	12.0	
95	24	520	410	340	420	310	140	50	1,040
95	48	400	320	380	268	270	186	136	1,430
42	24	540	260	250	260	220	270	160	550
42	48	320	213	210	258	195	140	125	1,000

TABLE V

Effect of Acetic Acid Upon Growth of Food Poisoning Micrococci

Culture No.	Time of Incubation	Number of Organisms (million) per c.c. in Increasing Percentages of Acetic Acid					Number of Organisms (millions) per c.c. In	
		0.05	0.10	0.15	0.20	0.25	Inoculum	Control
95	24 hours	1,470	170	3,960	7,200	0.2	7	2,400
	48 hours	1,450	590	0.7				2,090
	4 days	2,900	890					3,490
	7 days	1,870	1,350					2,680
42	24 hours	350	179	59	2	0.1	27	1,270
	48 hours	265	330	153				1,400

TABLE VI

Associative Action of Acetic Acid, Sucrose, and Sodium Chloride on the Growth of Food Poisoning Micrococci

Culture No	Time of Incubation	Number (million) Organisms per c.c. In			
		Sucrose 30% Sodium Chloride 10% Acetic Acid 0.10%	Sucrose 35% Sodium Chloride 11% Acetic Acid 0.05%	Inoculum	Control
95	24 hours	40	35	15	960
	48 hours	100	150		1,220
42	24 hours	35	34	19	750
	48 hours	58	48		1,250

Work of Pederson and Breed[4] has indicated that a combination or associated action of various inhibiting agents might take place when each agent in this combination is used in a per cent which when used alone was not sufficient to inhibit growth. With this in mind 2 media were prepared, one which contained 30 per cent sucrose, 10 per cent sodium chloride, and 0.1 per cent acetic acid, and the other 35 per cent sucrose, 11 per cent sodium chloride, and 0.05 acetic acid. Any one of these ingredients in the percentage used, if used alone would not materially inhibit growth. However, when used in combination (Table VI) a decided inhibitive action was apparent. In this particular experiment, 15,000,000 organisms were inoculated into these 2 media as well as the control. At the end of 24 hours, although a small amount of growth had taken place, it was materially less than that in the control.

It is apparent that types indistinguishable culturally from the toxin producing micrococci are widespread in milk and food products. It is also indicated that sucrose and sodium chloride have very definite inhibiting action upon the growth of the toxin producing micrococci, while small percentages of acetic acid not only inhibit but reduce the number of these organisms in veal infusion broth media. These ingredients were found to act in lower concentrations as inhibiting agents when used together than alone.

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Recent Trends in Pellagra*

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IN the early part of the present century two important but opposing views were advanced as to the cause of pellagra—one that it was of infectious origin, probably excreta-borne; the other, that it was of dietary origin, probably resulting from eating deteriorated foods. Eating "musty corn" was quite generally believed to be associated with the disease. These theories were, however, abandond when the brilliant investigations of Goldberger and his associates disproved the infection theory beyond any reasonable doubt and at the same time proved that the disease was of dietary origin. There are those who still refuse to accept this point of view and continue to espouse the infection theory.

Pellagra is principally a rural problem. It occurs mostly among tenant farmers of the South and among those who, through close association, have acquired similar food habits. It occurs less frequently in urban centers where the populace has access to a larger variety of foods in modern grocery stores, and where economic conditions do not become quite so distressing during hard times as they do for tenant farmers. The latter obtain their food at plantation commissaries or corner grocery stores which carry only a limited number of staple articles of diet. Antipellagra foods such as milk, lean meat, and vegetables are generally lacking. Except for some family gardening introduced in recent years, tenant farmers do not raise their own produce as do the independent farmers of other sections of the country. When hard times strike they find it necessary to restrict their diet even more than usual to those few staples that lack the essentials for health. It is then that the incidence of pellagra and the death rate begin to increase.

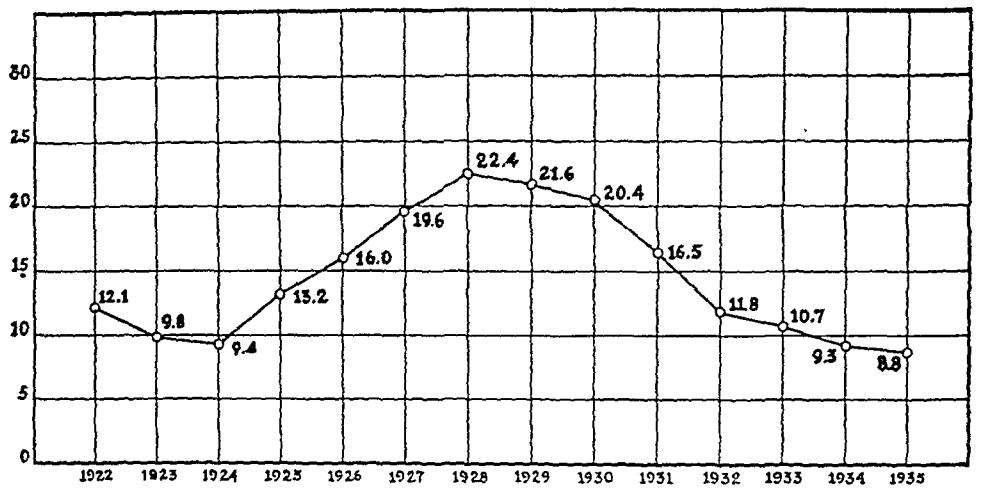
Goldberger and others frequently called attention to the relationship between the incidence of pellagra and economic conditions. They did not, however, distinguish between industrial and agricultural depressions, assuming perhaps that they were one and the same, which is not always the case.

The last agricultural depression began during the early post-war period, while the industrial depression did not begin until after 1929. Prices of farm lands and produce began to drop everywhere as early as 1920 and 1921, and continued until conditions on the farm became very distressing in some sections of the country, even long before the memorable crash of 1929. Pellagra began to increase at a rapid rate after 1924, reaching its peak about 1928. After that it began to decrease and has continued to do so to the present.

I call attention to this rise and fall because it indicates that trends in pellagra are more closely related to economic conditions in agriculture than industry.

* Read before the Food and Nutrition Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936.

FIGURE I



AGGREGATE DEATH RATE PER 100,000 FROM PELLAGRA IN THIRTEEN SOUTHERN STATES 1922-1935

Table I and Figure I show that the highest aggregate death rate for the 13 states where the disease prevails most extensively occurred in 1928. The rate increased from 9.4 in 1924 to 22.4 in 1928, an increase of 58 per cent. The aggregate rate for 1935 is 8.8, which is 60 per cent below the rate for 1928. This decrease varies in the different states from 43 to 74 per cent. These rates, namely 22.4 and 8.8 are the highest and the lowest aggregate rates respectively ever recorded for these states. In at least a few states pellagra was one of the first causes of death during the 2 or 3 peak years. It looks now as though this disease may be on the way out as a serious public health problem if the factors responsible for this unprecedented decrease remain in force.

The cause of the increase prior to 1928 is very evident but the cause of the decrease since that time, during the worst period of the depression for agriculture as well as industry is a matter of some speculation. Circumstantial evidence, however, points very strongly to 2 measures—the promotion of gardening and the use of pure powdered yeast. Both projects were introduced by the Red Cross in 1927 in the flood areas of 4 states in the Mississippi Valley—Mississippi, Arkansas, Louisiana, and Tennessee. The following years they were extended into other states. By 1929 the majority of health departments in the 13 states referred to participated in a yeast distribution program.

During the period from 1927 to 1935 inclusive, the Red Cross distributed some 500,000 lb. of yeast through its chapters, health departments and physicians, and well over 750,000 packages of garden seeds. Even larger quantities of both yeast and seeds were distributed by health departments, farm bureaus, and relief agencies.

The largest seed distribution by the Red Cross was made in the spring of 1931, when 611,000 packages containing from 13 to 18 varieties of seeds were distributed to as many families. Each package weighed about 4 lb. and contained seeds sufficient to plant from ¼

to ½ acre. Literally, thousands of acres of fertile land were converted that year into gardens in sections of the country where gardening had become a lost art. Families that had depended upon cotton or some other "cash crop" for trading at the grocery stores and commissaries, now raised part of their own food supply. Canning and other methods of preserving foods for winter use were also introduced. Thousands of families were thus able to supplement the food they obtained from the grocery store with "protective foods" grown in their own gardens. There can be no doubt as to the health value of this simple but effective measure.

Absolute proof that the two projects referred to were responsible for this reduction is lacking and can be obtained only through carefully controlled field experiments. There is no record of such experiments. Goldberger and others have repeatedly proved the antipellagra value of milk, lean meat, certain vegetables, pure yeast, and other foods. However, the experimental application of this knowledge in the civilian population on a sufficiently large scale to determine the relative value of these measures under controlled conditions is lacking. A large number of local health officers either independently or in coöperation with the Red Cross have distributed powdered yeast among pellagra families. Several have kept records of the distribution and tabulated results. Similarly, a number of agencies participated in promoting gardening, but we do not know of any instances where a control group was set up with which to compare results. In spite of that, considerable evidence has accumulated to indicate that gardening and pure yeast have been very effective measures.

Space does not permit quoting extensively from reports and letters of health officers, physicians, and others, a large number of which accumulated in our files. They nearly all agree that gardening and the use of powdered yeast, together with the educational efforts necessary to introduce these projects, have been largely responsible for this recent downward trend. One county health officer reports:

> In 1931 there were 1,313 cases of pellagra reported in the county and 890 packages of yeast (2 lb.) were given to the indigent patients. In 1932 the number dropped to 331, which indicates that the yeast has been effective in controlling the disease.

Others write as follows:

> We consider gardening an essential factor in the control of pellagra and probably largely responsible for the downward trend. . . .
>
> I believe that powdered yeast as an emergency measure in the absence of an adequate diet is most effective. . . .
>
> Growing gardens is encouraged generally by the planters among their tenants. . . .
>
> It is our impression that commissaries and grocery stores keep salmon and other antipellagra food in stock more than in former years. . . .

These quotations are representative of the views expressed by a large number of health officers and physicians who have had opportunity to observe the application of these measures.

Table I of death rates also seems to indicate some relationship between the time these measures were introduced and the beginning of the downward trend. For example, the distribution of garden seeds and yeast was started in Arkansas, Tennessee, Louisiana, and Mississippi in 1927. That was also the peak year for 3 of these states. Mississippi had a slight increase the following year. The distribution was extended to neighboring states in 1928, among these Kentucky, Alabama, and Georgia, 2 of which had their highest death rate that year. Oklahoma and Texas were among the last to introduce powdered yeast. Their highest rates occurred in 1930. That coincidence at least adds

TABLE I

Death Rates from Pellagra per 100,000 Estimated Population (U.S.P.H.S.) for the Years 1922 to 1935, Inclusive

State	*1922*	*1923*	*1924*	*1925*	*1926*	*1927*	*1928*	*1929*	*1930*	*1931*	*1932*	*1933*	*1934*	*1935*	*Per Cent Reduction from Peak Year*
Virginia	4 6	3 3	3 2	4 1	4 8	6.5	8.0	9.4*	9 0	8.3	5.3	4.8	4.8	5.3	43
North Carolina	12 2	8 6	9 9	13 2	15 4	22 3	27.8	30.3	32.4*	21.6	14.8	12.0	13.0	11.3	65
South Carolina	25 2	19 5	19 7	25 4	32 8	44 8	57.8*	54.4	45 2	33.7	24.9	18.8	17.4	14.9	74
Georgia	17 2	15 1	11.5	12 6	14 6	21.2	29.6	30 2*	24.4	19.5	17.0	14.3	10.7	10.9	63
Florida	10 1	8 9	8 6	10 2	10 2	16 6	21 0	22.0*	16.1	14.5	13.1	12.3	14.3	11.2	49
Kentucky	3 0	2 7	2 3	3 5	5 7	6.2	6.9*	5.1	4.9	4.2	2.6	3.5	2.2	2.4	65
Tennessee	11 3	12 2	10 7	15 4	21.1	23 8*	20.3	15.9	15 5	11.4	10.9	8.6	8.0	7.4	69
Alabama	16 6	15 4	14 6	16.5	19 8	21.7	27.0*	25.4	24.0	16.9	13.2	13.8	11.1	9.0	67
Mississippi	24 4	21.9	23 0	29 9	29.2	36.2	38.3*	37.8	28.4	27 8	17.3	15.0	11.1	11.3	70
Arkansas	11 3	12 1	9 0	17 3	27 0	35 9*	34.5	27.9	26.2	23.0	11.8	12.1	9.3	9.3	74
Louisiana	7 2	8 0	9 6	18 0	13 5	16 9*	16.1	13.7	13.0	11 4	8.3	9.0	6.7	6.4	62
Oklahoma	4 7	3 0	2 6	5.6	8 9	7 8	10.2	11.8	12.5*	9 9	6.1	4.4	4.2	4.7	62
Texas		5 0	5 7	10 3	13 6	14 5	15.1	15.0	18.9*	17.6	11.8	11 9	9.5	9.9	47
Aggregate rates	12 1	9 8	9 4	13 2	16.0	19.6	22.4*	21.6	20.4	16.5	11.8	10.7	9.3	8.8	60

* Peak year 1935 rates are provisional.

to the weight of circumstantial evidence.

There is some evidence that where either gardening or the distribution of yeast is discontinued the disease again increases. That occurred in at least one state after the Red Cross discontinued both projects in 1932. It was believed that their value had been sufficiently well demonstrated to be continued through local initiative, but this did not prove to be the case. The rate in that state increased in 1934 and again decreased in 1935 when the distribution of yeast was resumed.

All of this is circumstantial evidence, but it seems to be quite convincing. Such evidence should be accepted until more scientific proof is available. Scientific medicine has made progress that way through the years and it will continue to do so. It will develop measures that are born of experience and observation as well as through experimentation. It is hoped, however, that some one will conduct the field experiments necessary under controlled conditions to determine not only the relative value of these measures, but also whether all or nearly all deaths from pellagra in a given area can be prevented by these or other measures. Considering the progress made in recent years, that does not seem at all impossible, and is worthy of careful study.

Relief measures may have had some influence on this downward trend, but only to a limited extent. The relief program did not start on a national scale until the fall of 1930 following the devastating drought. Federal relief did not begin until 1933. The downward trend was well under way long before that time. Local relief efforts were too scattered to influence materially this situation in all these states.

Pellagra can eventually be prevented only through the use of proper foods, among which vegetables are all important. Milk, lean meats, liver, and fish are also valuable antipellagra foods, but

for economic reasons are not available in sufficient quantity to a large part of the farm tenant population of the South where the disease prevails most extensively. Until economic conditions for these people are improved and their food habits changed, they cannot or will not include these articles in their diet. Experience indicates that they can and will use garden produce. Gardening therefore occupies a unique place in the pellagra control program.

Pure powdered yeast occupies an equally important place in this program. For those who have developed symptoms of pellagra and for those who cannot or do not use the foods they need to prevent this disease, pure yeast is most valuable. It contains the pellagra preventive in quantity and form especially well tolerated by patients complaining of digestive disturbances, which is very common in pellagra. That cannot always be said of other antipellagra foods. Pure yeast is unusually well suited for treatment purposes, and it is comparatively inexpensive. It can be purchased at present for 19 cents a pound.

In the absence of other physical complications, 50 to 60 grams a day for from 6 to 10 weeks will relieve the individual of all symptoms of the disease and restore him to what seems to be a normal state of health even without any alteration in the regular diet. Smaller amounts are sufficient as a preventive.

The pellagra problem cannot be solved by ordinary educational methods. Even the most intensive efforts to spread information about dietary requirements will not suffice. That may be helpful to a few, but not to the vast majority of families who are victims of the disease by force of circumstances over which they have no control. It is not enough to tell them that milk, lean meat, and vegetables will prevent pellagra unless it is also made possible for them to obtain these protective foods without extra cost.

Pellagra is principally a poor man's disease and can be prevented only by measures within his reach. Family gardening and pure yeast, both of which are available at low cost, seem to meet these requirements best.

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The Public Health Nurse*

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FOR a good many years I have been both interested in and personally concerned with various aspects of the great public health movement and it is inevitable that anyone who has had that experience should come into touch with the nursing profession generally, and more particularly with the visiting nurse, and in these later years with the public health nurse with all that that term and that individual mean for the general welfare.

I remember very vividly the beginning of the organized campaign against tuberculosis in this country and how we conceived of that first as a campaign of education. It was a matter of mass education. It was based upon the dramatic discoveries of medical science and their obviously possible application to the prevention of disease and to the administration of that application by public health authorities. We must remember that in those earlier days the conceptions of public health administration were rather crude. Of course there were certain essential things recognized—a pure water supply, a pure milk supply, etc.—but public health officers busied themselves chiefly with minor and not very important things. I sometimes used to feel that they were often more concerned with what were rather esthetic considerations, such as sewer gas and other malodorous emanations. The objects were rather unpleasant but were not very dangerous.

Then came a completely new conception. And in this tuberculosis campaign we found, I say, that the first thing to be accomplished was the education of the public. But soon we began to realize that after all it is not simply the education of the masses, except for the creation of a public opinion that would support official effort, that was necessary. But in the last instance if we were to get results we must come down to the individual and to his individual health habits. And the individual in his health habits is not to be reached effectively by the propaganda of organized agencies; he is going to be reached by the individual. And so we came to realize that the essential individual in this work was the visiting nurse, that there was nothing quite equal to her and her possibilities in the application of the knowledge of which I have just spoken.

In saying that, one recognizes, of course, the indispensability of the medical profession and of the public health officials and of an enlightened public opinion.

Now what we found in the field of tuberculosis was found in the same way in the organized campaign against that civic blot of infant and child mortality, as well as in the case of various preventable or infectious diseases. We are seeing it now in certain of the enemies

* Address before the Silver Jubilee Luncheon Meeting of the National Organization for Public Health Nursing, Hotel Roosevelt, New York, N. Y., March 18, 1937.

that disable mankind; for example in the present campaign, too long delayed, which is being inaugurated on a wide scale against venereal disease. Other countries have demonstrated what can be done in checking the spread of syphilis and I am sure comparable results can be obtained in this country. And there remains another equally important challenge, and that is the whole field of mental hygiene, which calls for organized consideration in the same way.

Laboratories discover facts and it is one of the dramatic achievements of modern times that medical science has advanced as it has. And it is most encouraging that public authorities are coming to recognize that there must be created and maintained highly intelligent and competent official agencies with adequate resources to apply to the public welfare the facts and truths that have been discovered by medical science and whose applicability has been demonstrated by the medical profession. And in my judgment the agency that brings this possibility to a focus and accomplishes results is the public health nurse. I am very glad indeed of the opportunity of saying that as I have watched it from the sidelines during these 30 odd years I have come more and more to feel that without the public health nurse the efforts are ineffective.

To my mind one of the greatest events that have taken place in this country was that to which allusion has been made more than once this afternoon. That was the establishment in 1893 of the Henry Street Settlement. I wish to add my tribute to what Miss Wald has accomplished there, not simply as a contribution to New York City but to the entire country and to the world.[1] From that beginning has grown this great movement that we celebrate today.

Miss Fox in her remarks,[2] and particularly in her closing words pointing toward the future, emphasized the necessity of the adequate preparation of the public health nurse and the production of a much larger number of them. The problem today in my judgment in the whole public health field is the lack of adequate personnel, and I am speaking of the medical personnel as well as of the trained official and the public health nurse. There are communities today ready to take steps and there are not competent people to staff the effort. Further, with the development of the Social Security Act and its application in the future throughout this country, this need will become greater and more obvious. There has been a tendency to think that any person who has gone through a certain course, whether in medicine, or, in the case of a nurse, through a nursing school and has acquired those magical letters "R.N.," is entirely adequate, entirely competent to take up this line of activity. The public health nurse to be successful demands qualities that are called for by no other group in the nursing field. The bedside nurse of course must be competent, but the task of the public health nurse calls not only for the training of an R.N. but for something more. In my judgment the public health nurse cannot be too highly trained. I can share the opinion of certain of my medical colleagues that we can do in certain cases of illness with nurses of less complete training but we cannot do without nurses of the highest quality and the highest training in this public health field. I would like to see more and more college women coming into the nursing schools, passing through them, taking up postgraduate work, and specializing in this public health field.

Now is it any wonder that, having come through these long years of watch-

ing and deep interest in the application of knowledge to the different fields of public health, I should welcome the opportunity of paying my tribute to what the public health nurse has done and to what the National Organization for Public Health Nursing has accomplished in leading the way and demonstrating the possibilities? That this organization is needed is beyond all question. That it will develop and grow is equally certain and necessary. My congratulations are to the N.O.P.H.N. for what it has already accomplished and I bid it God-speed for the future.

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IN JULY JOURNAL

Developing a Housing Program in a Southern City
L. M. Graves, M.D., and A. H. Fletcher

Practical Procedures in the Laboratory Diagnosis of Typhoid and Related Fevers
T. F. Sellers, M.D.

Infant Mortality in New York City
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Some Observations on the Practical Value of the Complement-Fixation Test in the Diagnosis of Amebiasis
Charles F. Craig, M.D.

Measurement of Error of Death Rates in the Colored Race*

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THIS subject can be considered in two ways: (1) as the measurement of error of total colored death rates. How complete is the registration of colored deaths? (2) It can also be interpreted as the measurement of error of the colored death rates from specific causes. How accurately does the total number of deaths from a specific cause give the actual deaths from that cause?

Probably all of us would answer the first question by stating that the registration is not complete. The question of the measurement of the error is more difficult.

Fifty-eight per cent of the colored population of the United States were living in 12 states of the South in 1930. This colored population of 8,042,000 was 99.5 per cent Negro and constituted two-thirds of the Negro population of the United States. The problem of measurement of error of colored death rates, meaning Negro death rates, centers mainly in this group of states rather than in other sections of the country. For this reason, and also to avoid some of the factors influencing colored death rates over the country, the present discussion has been limited to the colored death rates of this group of southern states.

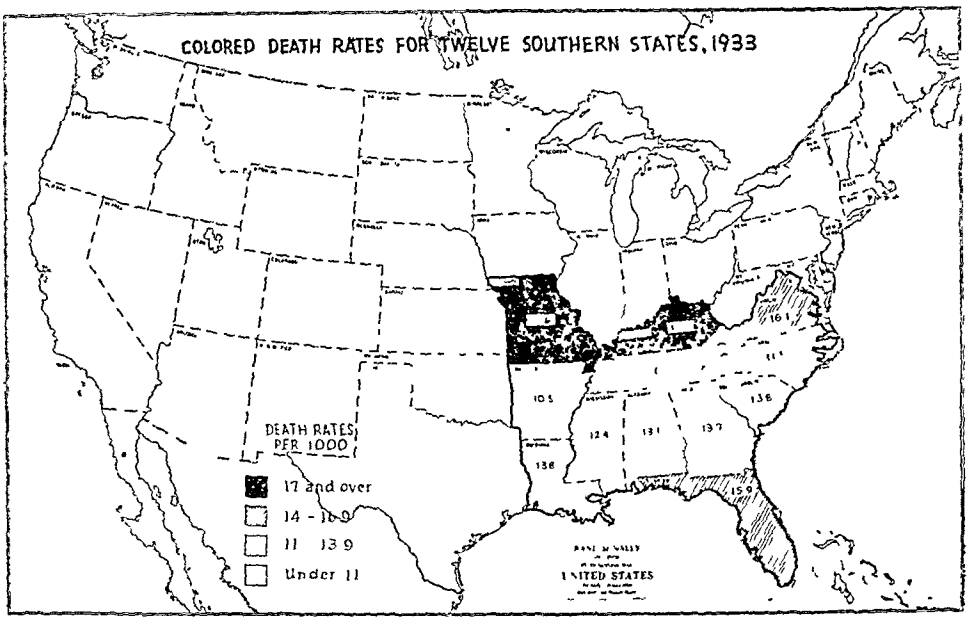
The colored death rates for these 12 states as given in the *U. S. Census Mortality Statistics* for 1933 are shown on the accompanying map (Figure I). The great variation in the colored death rates in this group of states, from 10.5 in Arkansas to 12.4 in Mississippi, 16.0 in Tennessee, and 18.7 in Kentucky, is noteworthy. The death rates of Louisiana, Mississippi, Alabama, Georgia, South Carolina, and North Carolina are low in comparison with those of Missouri, Kentucky, Tennessee, Virginia, and Florida. These colored death rates need further study with adjustments for many variables.

A correction for the difference in age composition of the colored population of the states is essential. The standardized death rates * which are given in Table I for comparison with the crude death rates do not show as much variation. The 4 highest rates—Kentucky, Missouri, Virginia, and Tennessee—are lowered, while a few of the lower rates are increased. However, the variations in these standardized colored death rates, from 10.5 in Arkansas to 16.4 in Florida, are much greater than would be expected. The white death rates for the same states for the period 1929–1931, as given by Dublin and Lotka,[1]

* Read before the Vital Statistics Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

* The death rates are standardized on the basis of the age distribution of colored population of United States, 1930 Census

FIGURE I



do not show as much difference. The standardized white death rates of these same states vary *from* 9.3 in Arkansas to 10.9 in South Carolina. Although the period is shorter and the number of deaths smaller, the colored rates for other years show the same general relation.

The data for the urban and rural sections of these states show marked difference. Here the urban population has been defined as the population in the cities of 10,000 and over in 1930, and the rural as the remainder of the states. This definition was used to have comparable figures for all these states. The average urban death rate of 20.5 is 61 per cent higher than the rural death *rate of 12.7 in* 1933. These figures can be compared with the difference of 18 per cent in the crude white, urban and rural death rates in 1930, as given by Dublin and Lotka.[1] These are not resident figures, which are preferable for any discussion of urban and rural rates.[2] However, the experience in Tennessee has been that the colored people usually die at the place where they live and the correction to residence has not changed the total colored urban and rural rates by more than 3 per cent. This great difference between urban and rural colored rates is very puzzling. Probably the registration of colored deaths in the large cities is nearly 100 per cent. Should

TABLE I

Crude and Standardized Colored Death Rates per 1,000 Population of 12 Southern States, 1933*

	Crude	*Standardized*
Alabama	13.1	13.1
Arkansas	10.5	10.5
Florida	15.9	16.4
Georgia	13.7	14.1
Kentucky	18.7	15.4
Louisiana	13.8	13.8
Mississippi	12.4	12.7
Missouri	18.6	16.2
North Carolina	11.8	12.6
South Carolina	13.8	15.1
Tennessee	16.0	15.2
Virginia	16.1	15.5

* Standardized on the basis of the age distribution of the colored population of the United States, 1930 census

the *rural* rate be as large as the *urban* or what proportion of the urban? It may be that conditions in the rural area are more favorable for the colored population and that the rates are actually lower.

The amount of rural population differs in these 12 states. With the exception of Missouri, in which but 32 per cent of the colored population is rural, the percentages of the colored population in the rural area vary from 57 to 90. Account should be taken of this in considering the total death rates, or rural and urban rates should be studied separately. The rural rates when compared have practically the same relation in size as the total death rates. Arkansas has the lowest rural rate of 9.2, with the rate of North Carolina, 10.3, second. The rural rates of Missouri, Kentucky, and Virginia are high.

To go a little further into the study of rates in the rural area and to eliminate some of these factors, the colored death rates for Tennessee have been used. As it is difficult at this time to estimate populations for small areas and especially colored populations, the 1930 Census figures have been used as the basis for colored death rates. The resident colored death rates in Tennessee have been obtained for the average of the 3 year period, 1933–1935. The rates have not been calculated in counties where the colored populations were less than 1,000, as large variations in the rates would be expected, due to chance alone.

The variation in the death rates of the counties of Tennessee is very great. The counties with the large cities, that is, Shelby, Davidson, Hamilton, and Knox counties, have high rates. In Middle Tennessee, the rates are relatively higher than in West Tennessee, which has a large colored population. The colored population varies in these counties in West Tennessee with the largest percentage of colored population in Fayette County (73 per cent). The living conditions for the Negro in this section of Tennessee are probably nearly the same as in Arkansas and Mississippi. From a knowledge of conditions in the state, it would probably be expected that the rural rates in West Tennessee would at least be equal to or greater than those in Middle Tennessee.

The data for the rural counties of Middle and West Tennessee, in which the population was 10 per cent colored, have been combined and standardized rates obtained. The effect of standardization of death rates within the state can be seen in Table II.

TABLE II

Crude and Standardized Colored Death Rates for Urban and Rural Areas of Tennessee and Rural Counties in Middle and West Tennessee, 1933–1935*

Tennessee	*Crude Death Rate*	*Standardized Death Rate*
Urban Area	19.7	20.0
Rural Area	13.0	12.8
Fifteen Middle Counties	14.5	13.4
Fifteen West Counties	11.8	12.1

* The death rates are standardized on the basis of the age distribution of the colored population in Tennessee, 1930 Census.

Standardization of the urban and rural rates increased the difference. It decreased the difference in the rates of the counties in the two sections of the state from 23 per cent to 11 per cent. This difference of 11 per cent was probably due to better registration of deaths in Middle Tennessee. It could not be assumed that the registration of colored deaths was 100 per cent complete in Middle Tennessee; so with allowance for a failure to have some of the colored deaths in Middle Tennessee recorded, and a larger per cent in West Ten-

nessee, the rural rate would be increased to between 14 and 15. This is suggested as a minimum figure. It was hoped to learn through a survey more about the completeness of registration of colored deaths in the two areas. Due to the closing of some of the schools for the cotton picking season, a report on the survey cannot be given at this time.

These figures show the variations in colored death rates. As the variations are large even within the state of Tennessee, it is believed that they may be due to incomplete registration in the rural area.

The accuracy of the death rates from specific causes depends on many factors. First, the size of the rates will depend on the completeness of registration. Second, the accuracy of the death rates will depend on the quality of certification of causes of death and the amount of variation in the type of certification. The attendance at death and the certification of causes of death by physicians are essential.

The data for Tennessee for the 3 years, 1933–1935 (Table III), show the difference in the number of deaths certified by physicians in the urban and rural part of the state.

The percentage of deaths certified by physicians in the urban area was 94.0, with an additional 5.8 certified by coroners and health officers and 0.2 per cent by others or unknown. In the rural area 86.7 per cent were certified by physicians; 9.5 per cent of the deaths were not certified by physicians, coroners, or health officers, and were not considered certified correctly. The percentage of death certificates signed by physicians in the 15 counties of Middle Tennessee of 91.6 was 9.3 per cent greater than the percentage in West Tennessee of 82.3. These figures show that the correct certification of colored deaths in the rural area in Tennessee is not complete. In the 15 rural counties in West Tennessee, where the colored population is large, 17.7 per cent of the death certificates were not signed by physicians, as they were not in attendance at the time of death.

Complete data for these 12 states regarding attendance at death are not available. The deaths assigned to *ill-defined and unknown causes,* which include a large part of the deaths which were not attended by physicians can be used in connection with this problem.

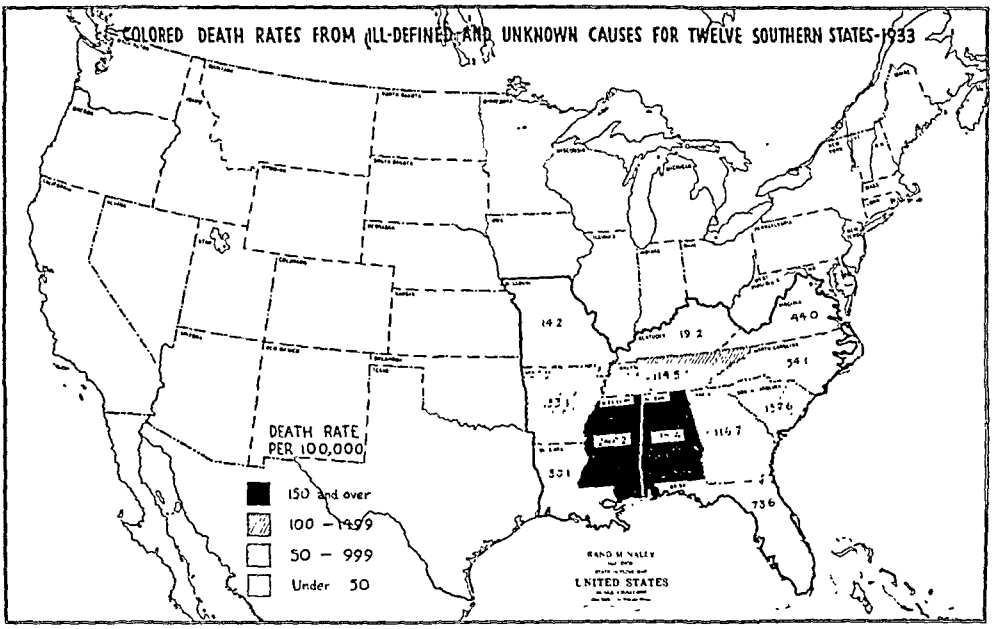
The colored death rates from ill-defined and unknown causes of death for 1933 are shown on the accompanying map (Figure II). The rates varied in this group of states, with low rates for Missouri, Kentucky, Virginia, and Louisiana. The death rates for Mississippi and Alabama are very high, with those for Tennessee, South Carolina, Georgia, and Arkansas over 100

TABLE III

Certification of Resident Colored Deaths for Urban and Rural Areas of Tennessee and Rural Counties in Middle and West Tennessee, 1933–1935

		Physician		*Coroner*		*Health Officer*		*Others or Unknown*	
Tennessee	*Total*	*No.*	*Per Cent*	*No.*	*Per Cent*	*No.*	*Per Cent*	*No.*	*Per Cent*
Urban Area	12,737	11,969	94.0	701	5.5	37	0.3	30	0.2
Rural Area	10,677	9,252	86.7	302	2.8	114	1.1	1,009	9.5
Fifteen Rural Middle Counties	3,464	3,173	91.6	9	0.3	63	1.8	218	6.3
Fifteen Rural West Counties	5,198	4,277	82.3	271	5.2	27	0.5	623	12.0

FIGURE II



deaths per 100,000 population. In Mississippi, the cause of death was unknown in 1 in 5 deaths; in Alabama, 1 in 7. For the group as a whole, 8 per cent of the deaths were from ill-defined and unknown causes. This large percentage of deaths from unknown causes invalidates any discussion of colored death rates from specific causes. It is not known how the 2,547 deaths in Mississippi and 1,767 in Alabama should be distributed among the different causes of death. It cannot be assumed that these deaths distribute equally among all causes or age groups, as many factors are responsible for the causes of death being unknown. For instance, while 8 per cent of all deaths are assigned to unknown causes, 23 per cent of the deaths under 1 year of age fall into this group. In fact, in Mississippi the causes of death were unknown in 49 per cent or practically one-half of the deaths of infants under 1 year of age.

The death rates from ill-defined and unknown causes on this map can be studied in relation to the map of total death rates. The states with the high total death rates do not have as high death rates from unknown causes. Among the states with low death rates, the rates from this group of unknown causes vary. The certificates for these deaths without medical certification are the ones that are difficult to have filed. In some instances undertakers may not be employed and the families of the deceased may not know the vital statistics laws. The registration of these deaths is a difficult problem. The size of rates from unknown causes may in part relate to the efforts of officials to get the certificates filed.

Colored death rates from specific causes have been obtained for 1933 for these states. These should be studied by urban and rural areas and corrected for a standard age composition of population. The maps of uncorrected death rates in general are similar to those of total death rates. For instance, the colored death rates from diseases of the heart are high in Missouri, Ken-

tucky, and Virginia, and low in Arkansas, Mississippi, and Alabama. What percentage of the death rate of 248.2 deaths per 100,000 population from unknown causes in Mississippi should be added to the death rate from diseases of the heart? It is impossible to answer this. The tuberculosis, cancer, and pneumonia death rates are high in the same states that have high total death rates. These rates from specific causes are negatively correlated with the rates from ill-defined and unknown causes. With the additional knowledge that other deaths are probably not recorded in these states with low total death rates, conclusions cannot be drawn about the relative size of death rates from specific causes.

This discussion points out some of the errors in the use of colored death rates. The total colored death rates vary far more than would be expected. Within the State of Tennessee, a large variation was shown in the rates of the counties, and it was suggested that this was due to incomplete registration of colored deaths in the rural area. As the death rates from ill-defined and unknown causes vary, the death rates from specific causes cannot be interpreted literally. These variables must be removed before the actual size of the colored death rates is known, and until that time, the colored death rates should be used cautiously.

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Supplement to July Journal

Place of Mental Hygiene in a Provincial Health Program*

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IT is the intention in this paper to describe briefly the manner in which mental hygiene has been made a significant part of the Provincial health program in Ontario. Since the effective integration of mental hygiene and physical hygiene in our program has been made possible by a somewhat unusual type of administrative organization, it will be useful to indicate at the outset something of the nature of this organization.

In Ontario, the Provincial Department of Health is responsible for the maintenance of such public health services as those provided by the Divisions of Preventable Diseases, Maternal and Child Hygiene, Public Health Nursing, Tuberculosis Prevention, Sanitary Engineering, and the Provincial Health Laboratories. In addition to these typical public health activities however, the Ontario Department of Health is also directly responsible for the maintenance, supervision, and administration of the Province's 12 mental hospitals.

The administrative inclusion of these mental hospitals within the Department of Health has had a considerable influence on the development of our public health program. It has meant that the specialized facilities in each of the various divisions mentioned above have been made immediately available to our mental hospitals. The medical inspectors in each of these divisions have become directly responsible for the supervision of their special aspect of health work as it applies in mental hospitals.

Thus, for example, the Division of Tuberculosis Prevention has been made responsible for this aspect of the medical care of mental patients. A careful survey of the entire mental hospital population, including both patients and staff, was completed 3 years ago. As a result, a separate mental hospital unit was established with suitable facilities for the specialized treatment of mental patients suffering from active or incipient tuberculosis.

Corresponding contributions have been made by the other public health divisions in respect to their particular fields. Inspectors from the Nursing Division have been made responsible for the supervision of nursing services and training schools in mental hospitals. The Division of Dental Services has supervision of the dental care of mental patients. The maintenance of proper sanitary conditions in mental hospitals has been made part of the responsibility of the Division of Sanitary Engineering.

Without further enumeration of the services concerned, it will be seen that each of the public health divisions be-

* Read before a Special Session of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 20, 1936.

comes responsible for some aspect of mental hospital work. One consequence of this is that our mental hospitals benefit from specialized supervision of their various services. Another, which is of particular interest here, is that the other public health divisions are made aware of the problem of mental disease. An exclusive emphasis on problems of physical disease is no longer possible. The fact that there are a larger number of patients in our mental hospitals than there are in all of our general hospitals, Red Cross hospitals, tuberculosis sanatoria, and hospitals for incurables combined, makes it evident that exclusive attention to the physical aspect of public health is not justified. Facing definite responsibilities in respect to mental hospitals, the various divisions of the Department of Health develop a much broader and more comprehensive view of the scope of public health work.

This direct contact with the problems of mental disease has a far-reaching effect on the attitudes of public health workers in other fields of activity. There develops an increasing recognition of the importance of those mental health problems which so often accompany and complicate physical illness. Since the inspection of general and private hospitals, and the amount of state aid granted to them, are matters which fall within the jurisdiction of the Department of Health, it has been found possible to do much to encourage a more adequate recognition of this mental hygiene aspect of the public health problem.

There are certain important implications which grow out of the idea that the problem of mental disease is essentially a public health problem. Applying in this field the same method of approach which has been applied almost universally in other fields of public health effort, it follows that we should shift our emphasis from the remedial treatment of those who are ill to the preventive treatment of those who are becoming ill. The value of this approach has been repeatedly demonstrated in respect to other public health problems. Moreover, our traditional pessimism regarding the inevitability of mental disease has given way, in the last quarter of a century, to a moderate optimism regarding the possibility of its prevention. In certain of the mental diseases, including some of those which contribute most heavily to our mental hospital population, there is already sufficient evidence of the value of preventive treatment to warrant a serious effort being made in this direction.

A preventive approach to the problem of mental disease presents certain difficulties, not the least of which is that it takes us out of the institution and into the community. It requires the development of a specially trained field staff, capable of identifying the early symptoms of poor mental health as they occur among people in the community, and ready to institute intensive preventive treatment in the earliest stages of illness. It was with a view to the development of such a field staff that the Department of Health instituted in 1930 a Mental Health Clinic service as part of its public health program in Ontario.

Before describing this service as it is now operating, it will be necessary to indicate something of its origin and development. In June 1930, the Province authorized the establishment of 6 travelling clinics to provide a preventive mental health service in the community. Before putting such clinics into operation, a special training course was arranged for prospective staff members. Those in attendance were addressed by persons with practical experience in the organization of similar programs, and were given an oppor-

tunity to meet representatives of the various agencies who would later be referring cases for examination. A special effort was made to see that they became familiar with existing community facilities for the treatment of the problems with which they would have to deal.

Following this, the clinics were one by one put into operation. The Province was divided into 6 large geographical areas and each clinic was organized as a travelling out-patient department attached to the staff of one of the mental hospitals in each area. Each clinic was staffed with a psychiatrist as director, assisted by a psychologist and a psychiatric social worker. The 3 members of the clinic operated as a team, all seeing each case and making their particular contribution to the solution of the problem presented.

Thus our Ontario Mental Health Clinics began operation much according to the general pattern of child guidance or mental hygiene clinics elsewhere. Although they have been considerably modified since that time, this initial approach seems to have been desirable in that the established agencies in the community were already somewhat familiar with the child guidance idea and almost immediately extended their full coöperation not only in referring cases for examination but in assisting with the treatment recommended.

These travelling clinics visited regularly more than 100 examining centers in cities, towns, and villages throughout the Province. During 6 years they have had nearly 15,000 cases referred for examination, more than half of which presented problems requiring follow-up treatment and have repeatedly returned to the clinic for this purpose. A very wide variety of problems have been encountered, not all of which could be said to represent early symptoms of mental disease in any strict sense. Naturally a large number of the cases at first referred to the clinics presented problems associated with mental defect or juvenile delinquency. In the majority of the cases of feeblemindedness the clinics were able to arrange a satisfactory community adjustment by supervising a special home training course prepared by the research division of the Ontario Hospital Training School, at Orillia. In more than 1,000 cases this special assistance given to parents or others concerned, rendered institutionalization of the child unnecessary. The initial prominence of this type of problem has gradually decreased until now such cases represent only a very small proportion of the case load.

Problems directly relating to mental illness have greatly increased. Except in one or two of the large urban centers in Ontario, there are practically no psychiatric specialists in the community. Efforts have therefore been made by the psychiatrists in charge of the clinics to develop contacts with practising physicians and extend to them a special psychiatric consultation service. As a result, a growing interest has been shown by physicians in the community and an increasing number of cases have been reached in which preventive psychiatric treatment is indicated.

One of the most interesting features has been the marked change in attitude on the part of our own mental hospital staff. The clinics have helped to break down many of those barriers of fear and superstition which have for so long tended to isolate the so-called "asylum." It is not only that they have encouraged the development of a more healthy attitude toward the problem of mental disease in the community; they have also served to bring our mental hospital staff into more direct contact with psychiatric problems in the community. In fact, this two-way effect

on attitudes has proved to be one of the most significant accomplishments. Attached as they are to the regular staff of a mental hospital, the clinics have served to emphasize that the problem of mental disease cannot be adequately defined in terms of mental hospital treatment alone.

By the spring of 1936, community demands for clinic services, in respect to all sorts of social and community problems, had become so heavy that it seemed desirable to undertake a critical review of the activities of the clinics and their methods of operation. As a result it was decided to define more narrowly the objectives of the Mental Health Clinic Service in order that there should be less dispersion of effort and greater concentration on those aspects of the work which had a direct and demonstrable value to the Mental Hospitals Division of the Department of Health. A statement here of the defined and limited objectives which were selected for special emphasis will serve to indicate both the present method of clinic operation and the particular clinic activities which, in our experience, have proved most worthwhile.

The Ontario Mental Health Clinics have now adopted 4 primary objectives as a basis upon which to select cases for examination and as a guide for the further development of their program:

1. To attempt the early recognition and intensive treatment of those adults in the community showing specific pre-hospital symptoms of mental disease.
2. To assist in the community treatment of psychoneurotic and other less severe mental and emotional disorders among adults.

These 2 objectives represent a field of special work which absorbs most of the time and effort of the clinic psychiatrists. As clinic directors, they are of course responsible for the work being carried on by the other members of their staff in respect to the remaining clinic objectives mentioned later. Having had 5 years in which to train and test the dependability of their associates, they are now in a position to delegate responsibility for certain aspects of the work and concentrate their own efforts on the preventive psychiatric treatment of adults. In this work their effectiveness depends upon their success in developing favorable professional contacts with practising physicians in the community. This can be accomplished most readily and satisfactorily by having the clinic director work independently as a consulting physician. Since the clinic examination centers are for the most part located in general hospitals, the director is able to specialize in this aspect of the work and at the same time give the necessary minimum of supervision to the clinic work as a whole.

It is difficult, if not impossible, to measure exact effectiveness of a preventive program. For example, it is impossible to state the exact number of cases in which the occurrence of mental disease has been permanently prevented by the early psychiatric treatment instituted. Nevertheless, it can be readily demonstrated that in a very large number of cases the necessity for admission to mental hospital has been, so far, postponed. In the field of physical disease, our preventive efforts do not guarantee permanent physical health. That is too much to expect in either field. If we are able to prevent the immediate development of either a physical or a mental illness, we have performed a worthwhile service to the patient which is of considerable economic value to the state. A critical review of the work of the clinics indicates that the necessity for admission to mental hospital has been postponed in a sufficient number of cases over a sufficient time more than to justify the entire cost of operating the clinics.

3. To locate and treat children in the community who are showing the characteristics of those who later become mentally ill.

4. To assist in the early removal of recovering patients from mental hospital, and to prevent recurrence through their readjustment and supervision in the community.

We have thought it desirable to abandon the vague formula that any childhood problem at all is a legitimate mental health problem for our clinics. We are attempting to select for special emphasis those childhood characteristics which are the specific early symptoms of subsequent mental disease. It may be that our present knowledge of just what these specific symptoms are, is limited. We know that many mental diseases show a history of slow and gradual development and that a significantly large proportion of our present mental hospital patients when they were children were extremely seclusive, timid, shy, unsociable, and submissive. It therefore seems reasonable to direct special attention to this type of child.

There are many agencies in the community dealing with children and it appears desirable that in our preventive health program we should specialize on learning to identify and treat effectively those particular children who are most likely to develop mental illness. It is recognized that psychiatric advice may be of value in respect to many juvenile problems other than those strictly in the field of mental disease. It is our intention to emphasize the importance of certain symptoms of poor mental health in children which are apt to be overlooked by agencies primarily concerned with the more obvious problems of delinquency and aggressive maladjustment.

This problem of preventive mental health work with children is one which calls for much further scientific investigation as well as for the intensive treatment of carefully selected cases. It is in respect to this problem that the psychologists attached to the clinics are primarily concerned.

The social workers attached to the staff of the Mental Health Clinics have now had extensive psychiatric training. An experienced psychiatric social worker can greatly facilitate the reëstablishment of recovering mental patients in the community and recurrence can often be prevented by continued supervision by such a worker. This type of work can be done most efficiently and economically by a full-time psychiatric social worker, operating to a large extent independently of the other members of the clinic, though the clinic director may be called in consultation.

It will be seen that, although originally organized in the traditional pattern of a 3 member clinic operating as a team, this pattern has been modified and adapted to allow for greater specialization by an experienced staff on those particular activities which have proved most valuable in our health program.

The individual members of our clinic personnel are now in a position to undertake a certain amount of independent responsibility. Thus, the clinic director in his psychiatric consultations with physicians, the psychologist in his preventive treatment of children, and the social worker in supervising the after-care of recovering mental hospital patients, are encouraged to attack directly the problems which arise in their particular fields.

This specialization and concentration has been facilitated by reducing the emphasis usually placed on the filling out of record forms and the completion of elaborate case histories. After several years of practical experience each clinic member knows the type of information useful in dealing with the problem presented and is directly re-

sponsible for securing that information. Keeping elaborate records is of less importance than the direct and efficient treatment of practical problems.

Mental hygiene has a very definite and worthwhile place in our Provincial public health program. Operating as the out-patient staff of our mental hospitals under the supervision of the Chief Medical Officer of the Province, the mental health clinics recognize as their primary objectives the performance of those specific public health functions described above.

As a result of our experience in attempting to develop a mental health service as an integral part of the public health program in Ontario, there are certain general observations which it may be useful to report.

1. The basic problem in developing any such program is staff training. Although certain technical skills can be assured prior to appointment to clinic work, practical experience both in mental hospital work and in dealing with mental health problems as they occur in the community must be obtained. The nature of the clinic program and the methods of operation are primarily determined by the training and experience of the personnel.

2. Another problem of major importance is the attitude of the community toward the proposed program. Within our own Province, there are such marked differences in attitudes that no uniform procedure can be applied effectively over the whole territory. Fortunately these community attitudes are susceptible of change, and it is doubtful whether there has been any more significant contribution made by the clinics than the influence they have exerted on community attitudes toward mental health and mental disease.

3. Because of the nature of these two basic problems, staff training and community attitude, the place of mental hygiene in a Provincial health program cannot be arbitrarily defined at the outset. Both the training of staff and the development of favorable attitudes are matters which take time. An effective mental hygiene program must be thought of in terms of growth and development. Our experience in Ontario does not lead us to think that we or anyone else can put forward a ready-made plan which will offer a final or ideal answer to the problem. It seems essential that those concerned in the development of a mental health service in a public health program should begin with a recognition of the major problems and should remain sufficiently self-critical to revise their policy and methods as the program develops.

Need for and Value of an Intensive Program of Health Education in State Health Departments*

FELIX J. UNDERWOOD, M.D., F.A.P.H.A.
State Health Officer, Jackson, Miss.

IN the recent destructive tornado in Tupelo, Miss., a servant's house occupied by a colored boy collapsed. After being called repeatedly, the boy finally answered from a pile of débris, "I hears you, but I cain't get to you." This, in a measure, is the situation in many health departments today so far as health education programs are concerned. We have permissive legislation, the necessary machinery and instruments, aims and objectives without number. Yet, we are not effectively removing the barriers which separate us from the masses of people we should be reaching.

These barriers are the lack of information and consequent lack of understanding. No public health program can be successful unless it has the confidence and support of the people who benefit by it. Full support cannot be secured unless there is popular understanding of the purposes and objectives of the program. Health education is the business of enlightening the members of a community concerning the activities of the health department and the essentials of healthful living with the ultimate purpose of influencing them toward higher standards of health conduct. The entire program of health conservation depends largely on a health-educated community which has confidence in the health department.

The need and value, then, of an intensive health education program is obvious. Perhaps, it is more to the point to decide what constitutes an *intensive* program and how it may be attained. Health education is admittedly not one of the neatly pigeonholed activities of a health department. It has none of the gratifying definiteness of a toxoid immunization or even a nuisance abatement. Oftentimes the very fluidity of the subject and the difficulty of evaluating results are discouraging to the practically minded health officer. But educate his community, he must! He knows that. The problem is how to plan, organize, and administer this program of community education so that the majority of people will benefit by it. It is said that the final test of health education is not how much information is distributed, but how behavior is influenced.

The philosophy underlying the entire program of a health department should be educational. Every contact made by the health officer, the nurse, the sanitary inspector, and so on through the entire personnel to the office clerks, has

* Read before the Health Officers Section, American Public Health Association, at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936.

a potential educational value and is an opportunity which should be fully utilized. Granted that health education methods are constantly changing, there are certain fundamentals about which there is general agreement. A basic one is that the most effective health education is a natural outcome of the services of the health department. Every immunization given, every water supply installed or improved, the very technic of the sterilization of a hypodermic syringe, the disposal of waste, the keeping of records, should be, not ends in themselves, not merely immediate benefits to an individual or a community, but convincing arguments for better living.

Popular health instruction, planned primarily for adults, is one phase of health education which has received considerable emphasis. Its purpose is to inform people concerning public health problems, to advise them of the policies of the health department in solving these problems, to secure desirable changes of opinions and habits, and to stimulate tax payers and influential groups to action in acquiring necessary facilities for carrying on adequate health work. In addition to the invaluable health instruction given by physicians, nurses, and other professional workers to individuals and small groups, there is the need of mass health educational effort through the press, radio, lectures, films, bulletins, pamphlets, exhibits, and the like. In the effort to reach as many people as possible, the publicity program must not, however, become attenuated. Like good generals we must concentrate our forces at strategic points and hammer away at these points from every conceivable angle until we have made lasting impressions.

The questions of economy and finance being always with us, we find it necessary to reach effectively as many people as possible for the least expense. It is highly desirable to secure the active participation of influential and well educated individuals and the aid in definite projects of local and state-wide civic and social organizations. This coöperative effort of leaders and well known organizations in a community with public health officials magnifies the importance of public health work, multiplies educational effort, popularizes health teaching, and stimulates the entire health program. While public health officials should not become enmeshed in political or factional operations they must not neglect to interest the candidate for election or the victor of the campaign in local health activities. Invite him to inspect a newly installed school water system, to see a special piece of drainage work, to visit a grade A dairy or pasteurization plant, to watch an immunization program. If this is done for every legislator before he goes to the state capitol the task of obtaining appropriations for health work will not be great.

An intensive program of health education cannot afford to overlook positive coöperation with and training for the professional groups. The state department of health should have a close working relationship with other state departments and with the state medical, dental, nurses, and other associations. The health department should place at the disposal of physicians, nurses, dentists, social workers, teachers, and others all facilities possible—library, laboratory, pamphlets, information relating to the public health, and the aid of its various divisions. It is of the utmost consequence that public health workers have as allies, dentists and physicians in private practice.

Working coöperatively with medical schools, medical associations, with federal assistance or that of philanthropic agencies, a plan should be devised

whereby physicians of many years' practice may take postgraduate or refresher courses, and deserving and promising young men may be sent to medical school. In order to enable every Mississippi physician to have postgraduate lectures at home, the Mississippi State Board of Health for the past 2 years has employed specialists in obstetrics and pediatrics to give courses of lectures in various parts of the state. Conferences may be held with physicians, nurses, and advanced medical students in order to effect closer contacts with the health department and problems concerning the public health. In this vital matter of keeping informed as to the latest discoveries in medical science and trends in public health, the personnel of the health department must not be overlooked. Here again, fellowships and scholarships must be bestowed, refresher courses taken, study and observation trips made possible. A program of health education is not sufficiently intensive which does not include the training of teachers for health teaching. Here is a splendid opportunity for coöperative effort between the state departments of education and health. The advancement of public health needs teachers properly trained in the principles of health education.

And now we come to the last, but not least important, phase of an intensive health education program: health education in the schools. The health education of the child may be strictly a function of the department of education, but the child's health, as well as his education along health lines, is a responsibility of the department of health. Here as nowhere else can an efficiently functioning health program display so much unity, cohesion of purpose, and coöperation. The supervisor of health education may be a member of the department of education, or a member of the department of health with an official standing in the public school system. But that consideration seems of less importance than that both departments do everything possible in an advisory and active capacity to promote sound health teaching in a sanitary and wholesome environment with the coöperation of parents, of official and unofficial health agencies, of clubs, churches, and outstanding individuals of the community. A joint council from the departments of health and education may do effective planning for health teaching in the schools, teacher training, and follow-up activities designed to aid the teacher.

The need for an intensive health education program in state health departments is self-evident. The necessary equipment is available; we know the principal barriers. Shall we supinely declare, as did the unfortunate darky in Tupelo, " I hears you, but I cain't get to you! " or, shall we take a more aggressive attitude? True, we cannot do everything at once. I doubt if any state department of health can undertake from the beginning all the phases of the intensive program outlined. Even if it were possible, I doubt if it would be advisable. Advancements with which public opinion and confidence do not keep abreast are likely to fail. But there should be long-range, careful planning from the start, with the willingness to undertake the various details step by step, and to modify or change these details as circumstances demand. Do not expect unqualified success to follow swiftly on your efforts. Health education takes time and infinite patience as we all know. But time, patience, and hard work, with a little inspiration here and there have worked miracles before—they will again!

EDITORIAL SECTION

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THE PUBLIC HEALTH NURSE

IT may seem supererogatory to call attention to the address recently given by Dr. Livingston Farrand, President of Cornell University, on the 25th Anniversary of the National Organization for Public Health Nursing. It was a notable occasion of which that Organization has good reason to be proud. Not often does one find as much meat put so clearly in so few words.

We wish to endorse all that Dr. Farrand said, and to add that for a number of years, all of those interested in public health work have recognized the value of the nurse and, as he points out, this applies particularly, as far as public health work goes, to the public health nurse. One has only to examine the estimates in model budgets which have been formulated after a careful study and note the relatively large amounts recommended for public health nurses to realize the truth of this statement. The growth of the visiting nurse service in the esteem of public health workers generally, is evidence of the high class work the nurses have done, and also shows the necessity of their being.

In a paper so full of meat it is difficult to pick out certain parts which are more important than others. We wish, however, to emphasize two statements. Dr. Farrand expressed the opinion that the greatest problem in the whole public health field, broadly speaking, was the lack of adequate personnel, medical, official, and nursing. As has been pointed out many times, some of this lack is due to the unfortunate situation which exists in our country; namely, that public health work is not appreciated by the politician, and that practically all public health positions which are worth having are regarded as political plums. Tenure of office for public health workers is much needed. The lack of it has had a baneful effect on the decision of young men and women to prepare themselves adequately for such work with the intention of giving their lives to it. As Dr. Farrand said, the application of the Social Security Act is making this shortage of personnel more acute.

The second point he emphasizes—which might well be considered as a part of the first—is that all public health workers, doctors, administrators, and nurses, need special training. He warns nurses against accepting the "magical letters, R.N.," as being entirely adequate, and as certifying that a nurse is entirely competent to take up field work. The public health nurse especially requires qualifications called for by no other group in the nursing field. As an administrator of one of our great educational institutions, Dr. Farrand says that in spite of the staggering cost of higher education, he still holds that the public health nurse cannot be too highly trained, that it is a necessity; and he expresses the hope that more and more college trained women will enter nursing schools, and, having graduated from them, will take up postgraduate work—special work—in the public health field.

We feel sure that every member of our Association will join with President Farrand in the congratulations he offered to the N.O.P.H.N. and his Godspeed for their future.

MILLIONS OF PATIENTS [1]

UNDER this title, with subtitle, "What the League is Doing for the World's Health," Dr. Heiser has given us an excellent summary of health as a world problem, showing the beginnings of international coöperation in 1851, a more effective agreement in 1893, and a still more notable action in 1907, when the International Public Health Office was agreed upon and established in Paris one year later.

The League of Nations came into existence in 1920, and the Health Organization of the League of Nations took its present form in 1923. It consists of: (a) a General Advisory Health Council, (b) a Standing Health Committee, (c) a Permanent Secretariat. The Health Organization has worked effectively toward the following objectives:

1. Control of epidemics and other diseases: the collection and dissemination of epidemiological data
2. Standardization of sera and biological products
3. Unification of health statistics
4. Publication of health information
5. Interchanges of health officers
6. Coöperation with other League of Nations groups and international organizations.

Under each of the headings given, an enormous amount of work has been accomplished which we cannot here even summarize, further than to give, as an example, what has been tackled under heading 1—Malaria, Smallpox, Leprosy, Syphilis, Collection and Dissemination of Epidemiological Data, and Ship Fumigation. It is easy to see what a far reaching and tremendous task the Health Organization has undertaken. It is not too much to say that great success has attended its efforts in practically every field with which it has concerned itself.

This booklet is of unusual value and we wish for it a wide circulation. In spite of what the press has told us, it is safe to say that the average physician does not know much about the Health Organization or what has been accomplished by it. This information is here given to us clearly and succinctly.

This entirely inadequate review cannot well be brought to a close better than by quoting from the conclusion of the booklet itself:

> The health work quickly justified itself. Great epidemics have been checked. Re-settlement programs for thousands of refugees have been carried out. Adequate protection for the ports of the world, and ships entering therein, has been secured through quarantine measures.

National health administrations have reaped the benefits of mutual understanding and increased appreciation of each other's efforts. An international *esprit de corps* has been broadened to a degree otherwise almost impossible. Joint action in emergencies such as epidemics has been simplified and made more quickly effective.

One cannot reflect upon the wide scope and results of the Health Organization's work without asking the question: If the League can do so much for the cause of world health through international coöperation, may we not hope that similar concerted efforts will some day cause the much desired world peace to appear on the horizon? Immediate success is not nearly so important as is the development of the will and the means to success. The health problem of the nations is by no means solved, but its solution can be greatly aided by the Health Organization of the League of Nations. On humanity's behalf the League is attempting to banish both disease and war forever from the earth.

REFERENCE

1. Heiser, Victor, M D *Millions of Patients. What the League Is Doing for the World's Health.* League of Nations Association, Mid-West Office, 75 East Wacker Drive, Chicago, Ill.

VALUE OF ANTI-ENTERIC VACCINES UNDER EMERGENCY CONDITIONS

THE apparently very spectacular success attending the practice of antityphoid vaccination in the military services naturally makes timely the consideration of its value under such conditions as obtain when serious local or national emergencies occur, such as the recent floods in the Ohio and Mississippi River valleys. Under the latter conditions we must not expect too much from antityphoid vaccination.

Without going into a full discussion of the experience with typhoid vaccine in civil communities it may be said that, in general, the results have not been so satisfactory as in military practice. Aside from the question of the intrinsic value of the vaccine, and the choice of particular strains for making the product, there are certain practical considerations that militate against high efficiency under emergency conditions; the chief of these is the difficulty in giving the required 3 doses of vaccine over a period of 2 weeks in time to derive from them any benefit that might be expected under more favorable conditions. In addition, there are no reliable data as to just how long after the course of injections is completed the tide of immunity will be high enough to protect the individual against doses of the infecting organism which may be expected to be rather larger than under average conditions. The flood conditions of early 1936 gave rise to little typhoid—too little to give any evidence of the value of the vaccine under the conditions that prevailed at that time. The relatively low incidence of typhoid in the flooded area in 1936 was almost certainly due to the prompt and efficient measures taken for the emergency purification of the suspected water supplies. These latter measures are of dependable value and obviously take precedence over immunological procedures in dealing with situations threatening from the typhoid fever point of view.

If the experience with water-borne amebic dysentery in Chicago in 1933 is of wide significance it may be expected the flood conditions will give rise to some cases of this disease. It seems clear that chlorination, probably the most widely used method of purifying polluted water, is not effective against cysts of *Endameba histolytica*—indeed, filtration and boiling appear to be the only methods which may be regarded as trustworthy.

NOMENCLATURE FOR THE COLON GROUP

WE wish to direct particular attention to the paper, Nomenclature for the Colon Group, published on another page of this issue. The short but lucid discussion presents the matter well and shows a sympathetic understanding of the difficulties of editors, but in spite of this, we doubt if the general reader appreciates the confusion which now exists in regard to this matter.

The Editor of this *Journal* was not the one who fell into the error of writing out *E. coli* as *Escherichia coli* when *Entameba coli* was intended. However, at the present moment there are on the Editor's desk two papers, one discussing the use of copper and chloramines in water purification, and the other the protection of the shellfish industry. Both refer to the intestinal group as an index of pollution. One speaks of *B. coli* and the other of *E. coli*, though both of them refer to the same test.

The action taken in the international congress in reserving the term bacillus for spore-forming organisms considers the use of *B. coli* distinctly wrong, yet as far as any authoritative statement goes, one term is as correct as the other. "B." should mean "Bacterium" and is usually so considered in dealing with this group. It has not been uncommon to find in journals two papers discussing practically the same matter, the first using one nomenclature, and the second the other.

Some 2 years ago the Editor entered into a fairly extensive correspondence in an attempt to formulate a style of nomenclature for this *Journal*. The result was a clear demonstration of the confusion which exists, and so far, no nomenclature has been adopted, nor has it seemed wise to do so until a greater unanimity of opinion among workers as well as taxonomists is reached.

The situation is irritating as well as confusing, and should not continue to exist. We believe that the Laboratory Section of this Association should take a stand at least for use in our society and *Journal*. It is to be hoped that the various bacteriological societies interested will unite in some recommendation. In the meantime, we will be glad to have the matter discussed in the columns of our *Journal*.

MEDICAL JOURNALISM

JOURNALISM is one of the oldest professions, and even medical journalism has a rather ancient origin—at least 2,500 years in the past.

The worship of Aesculapius had become associated with a form of medical practice some 500 years before Christ, and grateful patients sometimes erected tablets which recorded their treatment and its results, somewhat in the same way that such things are now told of in medical journals, so that we may say that medical journalism was then in existence. These tablets were placed in conspicuous places, and medical knowledge was disseminated through them.

At the time of Christ the Romans had their *Acta Diurna*—from which the word "journal" is derived—which gave some medical information, such as accounts of epidemics, for example. The term "newspaper" dates from the reign of Charles II of England. They were the product of news-letter writers, or "intelligencers"; were largely political; and contained no medical material. They became popular, and multiplied greatly, so much so that a list of the titles required

6 or 7 columns of Muddiman's *Handlist of Newspapers*. In 1642, they gave way to a crowd of "Diurnals," a term derived from the Roman *Acta Diurna*.

The *Foreign Medical Review* came into existence in 1779, and was the first strictly medical journal published in England, though there existed a number on the European Continent. A list compiled by Dr. Fielding Garrison, in 1934, required 40 double-columned quarto pages. Only 7 or 8 English publications are listed, among which are transactions of societies which are not medical journals.

The title indicates that even at this early date there was a feeling that medical matters were handled better abroad than at home, and the contents confirm this view.

There followed the *London Medical Journal* in 1781; *The Philosophical Magazine*, 1798; *Medical and Physical Journal*, 1799; *Annals of Philosophy*, or *Magazine of Chemistry*, etc., 1813 (with only a little medical matter); *London Medical, Surgical, and Pharmaceutical Repository*, 1814; *Medical Chirurgical Review*, 1820; and *Lancet*, 1823.

With the appearance of the *Lancet*, medical journalism changed its character and became tremendously virile. It was "new" in every sense in medical journalism, and gained immediate popularity. The great claim on the profession was that it stood up for the rights of the doctor in his professional position. It gave him medical information, and was the first journal to report hospital lectures. Bitter fights resulted over property rights, the *Lancet* going so far as to charge that many who were claiming the right to a monopoly in the teaching of medical students were not fitted by either skill or knowledge for the responsibility.

The story of the stormy career of Wakley has been frequently told and commented upon. He contested 10 suits for damages in the first 10 years of the existence of the *Lancet*. In all, only some $775 were awarded against him, while his costs were paid by public subscription. He did well by his medical public, and now medical teachers seek the columns of professional journals—and entirely too many the daily and Sunday issues of newspapers.

"When the promotion of medicine, and the standing and circumstances of practitioners, received the undivided attention of medical journals, the wide spread of knowledge followed in a reliable form, and with it sound professional intention. . . . in the records kept at the early Greek centres we had the basis for the production of systematic works; today the connection between the journal and the book becomes abundantly clear. The wealth of references to the contents of serial medical publications . . . shows that what happened 2,000 years ago is happening today; first we have the records and then the literature."

REFERENCE

1. Grains and Scruples—By a Chronicler. *Lancet*, Dec. 5, 12, and 19, 1936, pp. 1358, 1422, and 1485.

Watch for your copy

of

List of Members of the A.P.H.A.

Supplement to July Journal

PUBLIC HEALTH EDUCATION*

Health Education in Michigan—

In "Michigan Program for Professional Education in the Health Sciences and for Public Health Education," by Dr. J. D. Bruce (*Michigan Public Health*, Lansing, Mich., April, 1937):

The Michigan program for professional education in the health sciences and for public health education may be summed up as follows: *First*, a reorganization of the various health science units within the university to make more effective our undergraduate professional teaching and to foster research in the allied health faculties; *second*, a program of postgraduate education in all health fields, designed to supplement undergraduate teaching and to keep the professions in touch with the advancing sciences; and, *third*, the dissemination of useful health knowledge, together with information concerning the various health agencies and how they may be most effectively utilized by the public. In this program it will be noted that no new agencies have been created; simply that those already operating have been brought into greater usefulness. To paraphrase Sir Arthur Salter: We have taken the system we know, suggesting how it might be strengthened where it is weak, repaired where it has crumbled, and rebuilt where new needs require attention to its fabric.

Who Will Take the Next Step?—

Doubtless the thought of many readers is expressed by Dr. George M. Stevens, Epidemiologist, Department of Health, Los Angeles, who has written to several officers of the A.P.H.A.:

As one who is greatly interested in public health education, as affecting public health workers as well as the public, I have been watching with interest the efforts made in a few quarters to utilize the motion picture and the strip film for educational purposes.

Is it not time that the American Public Health Association, or the Public Health Education Section, accumulated a library of motion pictures and strip films that could be available to public health departments?

It is my thought that an editorial committee, working through various sub-committees, could prepare original films and slides, and pass on the acceptability of existing material for the instruction of health workers. And that the same committees would work on a separate series for the general public.

I would be pleased to know if a start has been made along these lines.

A New Sound Movie Trailer—

The New York State Department of Health, Albany, reports that

The Department's first sound motion picture trailer suitable for reproduction in theaters had its initial public showing as a part of the regular program at the Strand Theater, Albany, on April 8. It has since been shown in 7 other theaters in Albany and 8 in Schenectady.

The new sound short, "The Story of My Life by Tee Bee," was originally a "silent" prepared by the National Tuberculosis Association. With the endorsement of the Association, it was converted into a sound film by Thomas C. Stowell, assistant director of the Division of Public Health Education, with the coöperation of members of the division staff.

The trailer undoubtedly will be used widely in connection with future Early Diagnosis Campaigns against tuberculosis, such as that being conducted this month throughout the state and nation. The successful experiment was tried both in Albany and Schenectady of adding a short informative campaign message from the local health departments, definitely tying in the general film with the local plans. It is expected that this idea will be followed in future anti-tuberculosis campaigns. The trailer copies are available for use in any city or community in the state. Prints will be made in 16mm. size for use where the larger 35mm. projection facilities are not available.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

Four Neighbors—A motion picture is reported by Paul Komora in *Mental Hygiene:*

We are indebted to the Judge Baker Guidance Center of Boston for an addition to the all too meager supply of sorely needed pictorial publicity materials on mental health—a motion picture showing how problem children are studied and treated at this center, one of the foremost of its kind in the country. It is a silent, 16mm., 50 minute film, entitled *Four Neighbors.* It tells the stories of four 12 year old schoolmates, each of a different nationality and from a different economic and cultural background, who present, respectively a conduct problem, a vocational problem, a personality problem, and a family problem. The boys are sent by the school principal to the Judge Baker Guidance Center which, after months of treatment, finds a helpful solution for each of the problems. . . .

It is a fine achievement, a vivid dramatization of a difficult theme, with the seriousness, pathos, humor, and other ingredients of an appealing human-interest story, which carries conviction and reflects great credit on the enterprise and ingenuity of the Judge Baker Guidance Center and the staff that produced it.

Write to the Center at 38½ Beacon St., Boston, Mass.

Understanding the Child—Paul Komora, in *Mental Hygiene,* tells us that

After the lapse of a year, during which publication was suspended for lack of funds, *Understanding the Child,* the quarterly magazine issued by the Massachusetts Society for Mental Hygiene from 1931 to 1935, resumes its appearance as a regular publication of The National Committee for Mental Hygiene. This unique periodical, devoted to the mental health of children, has been a highly valued contribution to the instruction of teachers in the principles and practices of mental hygiene as applied to the classroom, and has had a wide circulation among the schools of Massachusetts. In recent years educators outside the state have begun to appreciate its excellence as a medium serving their special needs, with the result that there has been an increasing demand for the publication in other sections of the country. In one instance, for example, subscriptions were ordered in bulk for all the teachers of the school system in a large city. The National Committee now takes over the magazine in an attempt to make it available to elementary and high school teachers the country over, and to implement the gradually developing program in the field of education, in which the Massachusetts Society has done such important pioneer work.

Write to 50 W. 50th St., New York, N. Y.

Health Education in April, 1937, Journal—Here are selected references of interest to those doing health education. See references in April, 1937, issue of *American Journal of Public Health.*

Note "Can You Explain," on page XVII.

In "Relation to Bovine Mastitis to Human Disease" (page 340):

Educational programs relative to proper stable hygiene, the milking procedure, and avoiding the undue urging of dairy cattle to produce, will reduce these infections. An efficient veterinarian, with the aid of the laboratory, can be of great assistance in eliminating and controlling this vast economic and public health program.

"Health Museum" (page 345) reports new museum in Cleveland.

"Public Health and Physical Education" (page 350) suggests that:

Public health does and should publicize the major problems which endanger the health of our citizens. Perhaps the profession might well indicate specifically how the school, including physical education, may help in the early and effective solution of these problems.

Education in public health provided by experienced workers in this field should be made readily available to physical educators.

"The King's English" (page 362) officers a little lesson in good writing.

"An International System of Indices" (page 365) mentions health instruction as one of 44 subjects in a system of health indices.

"Muddled Information on Health"

(page 383) describes a "masterpiece of misinformation" in the form of an article on cancer appearing in *Coronet*. Material for letters and resolutions, and copy in health periodicals of all types.

In "Books and Reports" (pages 404–409) is the annual review of outstanding books in selected classifications.

New members of Public Health Education Section are listed on page 426.

A new quarterly, *American Journal of Safety* is announced on page 428.

For "Conferences and Dates" see page 432.

"The Educational Qualifications of the School Physician," in a Supplement (page 3) suggests postgraduate work which includes principles of health education.

Hygeia, May, 1937—Chief articles in *Hygeia*, 535 N. Dearborn St., Chicago, Ill. (copy free to health workers):

Syphilis . . . Your Skin and the summer sun . . . Pyorrhea quackery . . . The crippled child (rehabilitation) . . . Expert mother—greatest of career women (a pediatrician passes judgment) . . . Books for hospital libraries (common sense needed) . . . A trailer did the trick (for one man's health) . . . Cattle's contribution to mankind . . And so you're reducing! . . . The doctor in England . . . New hospitals for old (via PWA) . . . Hints for the home nurse . . . Jules Bordet (Belgium) . . . Nature's G-Men: birds . . . Live with heart disease and like it! . . . Questions and answers . . . New books on health.

In "School and Health":

The conflicts of adolescence . . . The school health examination may be an adventure in learning . . . Safety in water sports . . . Case studies of overweight children . . .

We Have Heard—That Newark, N. J., Health Department has issued a baby protection poster. Possibly it should be reproduced on this page to answer the inquiries about posters.

Probably other cities, or states, have issued posters. We would like samples for the *Journal*, and for display at A.P.H.A. convention in October.

What Does the Public Think?—*Fortune*, *Literary Digest*, American Institute of Public Opinion, many newspapers, and other agencies have cultivated a widespread interest in the possibility of counting the number of people who think or believe one way or another, or say that they do.

The possibility of attaining statistical accuracy is considered in "Practical Methods for Identifying Public Opinion," by Harwood L. Childs, in a mimeographed pamphlet, with a selected bibliography. Social Work Publicity Council, 130 E. 22d St., New York, N. Y. *25 cents*.

Dr. Childs describes current methods of probing public opinion, and emphasizes the statistical pit-falls into which amateur investigators are likely to stumble.

WANTED

Thus writes George A. Dunden, Director of Health Publications, Health Department, Milwaukee, Wis.

In coöperation with the Milwaukee Safety Commission the Milwaukee Health Department has available about 100 public bulletin sites for health posters 17" by 23" in size. Could you tell us where we may obtain such health posters for adults in quantity?

Several of the national health agencies may have a single poster but even that one may not be of the size needed. Milk and safety, and such efforts as Early Diagnosis Campaign offer about the only hope. Possibly readers will supply additional information.

From Dr. E. O. Chimene, Director of Public Health, Austin, Tex.:

In compiling a series of radio talks I would like to utilize as far as possible days, weeks,

or events of national importance that may have a health significance. Do you happen to have a calendar of such events or perhaps a list which gives the events but not necessarily the exact dates for any given year? You may be sure I shall greatly appreciate any help you may be able to give me.

What do readers suggest in addition to *News Almanac for Social Work* and *Almanac Notebook?* We hope that Dr. Chimene will report on the working out of his interesting idea.

From Broach Sanitary Assn., Sanitary Museum Hall, Broach, India:

I have the honour to request you to kindly send me posters, plays, booklets, pamphlets, etc., for the use of our health association free of charge. I am sending herewith a copy of our last annual report. Please also send us the price list of publications etc., of your Association.

IN ORGANS AND JOURNALS

"An Experiment in Health," by J. Allan. *Health*, 105 Bond St., Toronto, Ontario. March, 1937. *15 cents.* The Pioneer Health Centre, a health-recreational center in London; 25 cents a week (plus 10 cents a week for any children over 16 years) entitles the whole family to general privileges which include an annual medical examination with advice, but not treatment.

For effective examples of the conversational presentation of health facts look up the "Mark Time" series by C. K. Blanchard, in *Public Health News*, New Jersey Dept. of Health, Trenton. Ben Hustler and Mark Time tackle a wide range of health topics as the months go by.

"Good Nursing Publicity Through a Public Pageant." *Trained Nurse and Hospital Review*, 468 4th Ave., New York, N. Y. Nov., 1936. *20 cents.* Description with illustrations.

"Health Bills in Brief" is a heading in *Health Progress*, issued by New Jersey Health & Sanitary Assn., Freehold, N. J. We don't seem to find many health house organs giving attention to current legislation.

In *Hospitals*, American Hospital Assn., 18 E. Division St., Chicago, Ill. (Nov., 1936):

How we celebrate hospital day (Owosso, Mich.) . . . An essential program for hospital service plans (includes education in and out of the hospital) . . . Public relations from the viewpoint of the hospital trustee.

"Parent Education" is the general subject of a score of articles in the Oct.–Dec., 1937, issue of *Commonhealth*, Massachusetts Dept. of Public Health, Boston, Mass.

"Public Health and Social Work" has been added to the sections of book and periodical abstracts in *Journal of Home Economics*, Mills Bldg., Washington, D. C. A sample copy *free.*

"The Relationship of the Michigan Department of Health to the Practicing Physician," by Dr. C. C. Slemons. *Michigan Public Health*, Lansing. March, 1937. Reprinted from a medical journal. Describes in detail bureaus and services of the State Department of Health. "Believe it, or not" one may be confident that the state and local departments are not well understood by many physicians.

A score of periodicals "dealing with school health problems" are listed in *Bulletin*, Michigan School Health Assn., Lansing. March, 1937.

"Some Milk Superstitions," by J. H. Frandsen. *Journal of Home Economics*, Mills Bldg., Washington, D. C. April, 1937. *30 cents.* For use when talking or writing about health superstitions, an effective angle for many audiences.

Syphilis is the sole topic of the Jan.–March, 1936, issue of *Iowa Public Health Bulletin*, Des Moines.

Trailer health problems are getting into state health bulletins (Wisconsin, Michigan, New York, etc.).

Wolverine Health Bulletin is pub-

lished by the Michigan Tuberculosis Assn., 535 S. Capitol Ave., Lansing, Mich. Includes hidden name, added letters, true or false, etc., puzzles and tests. The accompanying wall calendar on one side includes illustrated health history: "Footprints on the Sands of Time."

DATES AHEAD

Camping, commencement, weddings, church Children's Day, Father's Day (June 20), summer weather and summer food, the end of school, July 4th, are some of the dates and topics ahead for more or less of a health angle.

The Summer Round-Up of the Children is well under way. Local units may register now, but they are too late for certificate awards. Apply to the state chairman of the summer round-up of the National Congress of Parents and Teachers.

MAGAZINE ARTICLES

"And the Truth Shall Make You Free," by Maxine Davis. Across the upper half of a 2 page spread appear "Infantile Paralysis," "Syphilis," "Smallpox," etc. A splendid piece of popular writing on syphilis and gonorrhea, with frequent mention of the two diseases. Realistic but unemotional. *Pictorial Review,* 316 West 57th St., New York, N. Y. May, 1937. *10 cents.*

"Cuba, Health-Insurance Test Tube"; "Spring Fever: Sulfur and Molasses to Cure Young Man's Fancy Gives Way to Clinical Study." *Literary Digest,* 354 4th Ave., New York, N. Y. May 1, 1937. *10 cents.*

"Fifty Years a Surgeon," by Robert T. Morris. Book condensed in *Book Digest,* 350 E. 22d St., Chicago, Ill. May, 1937. *25 cents.* Author usually "has been in vanguard . . . against those inclined to defend . . . the status quo."

"Human Blood for Sale." Two pages of pictures on professional blood donors, etc. *Look,* Des Moines, Iowa. May 11, 1937. *10 cents.*

"Medical Censorship in California," by Lillian Symes. What happened to the report of the "Medical-Economic Survey." *Nation,* 20 Vesey St., New York, N. Y. March 27, 1937. *15 cents.*

"No Place Like the Home for Accidents." (Pointers gleaned from a recent safety conference); "Eyes Have It" (factors in rapid reading); "Breath of Life" (technic for saving babies from asphyxia). *Literary Digest,* April 24, 1937. *10 cents.*

BOOKS AND REPORTS

American Medicine: Expert Testimony Out of Court—*By leading doctors and surgeons including men from every state. New York: The American Foundation,* 1937. 2 Vols. 1,500 pp. Price, $3.50.

The problem of providing "adequate" medical care to the people cannot be expressed as an American average. The problem varies from state to state and from one community to another within the same state. The attempts that have been made to solve it appear here relatively successful, there manifestly insufficient. As Dr. Hugh Cabot has most truly written, even physicians have had considerable difficulty in seeing the whole field. The American Foundation with the collaboration of 2,000 leaders of the profession (including Dr. Cabot) has now made it possible for each of us to see the whole field, to see it without bias, to look on it without emotion and faithfully to readjust our judgment in accordance with what we may see.

Do not imagine that these volumes are builded of the sublime speculations of some statistician upon the rigid and orthodox foundation of a questionnaire. The structure is far more original, the design more exacting, and the credit due to the architects proportionately great. The 2,000 authors were invited to offer their experience and suggestions in the widest possible terms. The editors were quick to seize upon every significant piece of evidence, every original idea, and by a tireless system of follow-up, extracted from each contributor his more reluctant wisdom. The material so obtained is classified under 11 chapter headings as follows:

1. Is adequate medical care now generally available?
2. Views on general principles and considerations that should underlie the organization of medical care
3. Medical education
4. Specialization
5. Group practice
6. The place of the hospital
7. Public health organization
8. Experimentation—state, county and community plans
9. State medicine
10. Health insurance, compulsory, voluntary, hospital, industrial
11. Limited state medicine and private practice

The subjects have not been completely covered even by the 5,000 letters received. Lest the reader should be tempted to suspect that omissions are due to an editorial blind spot, the editors themselves from time to time, point to the incompleteness of their report. Thus in a long chapter on specialization no letter can be quoted on the need for specialization in public health! The fact that hundreds of our colleagues are deeply concerned with making surgery a specialty and scarcely any of them are worrying about the training of health officers, is itself a fact of major social importance. It makes comprehensible, even tolerable, a good many of the opinions expressed in chapter 7.

On the other hand, the need for a reorientation of general practice, to bring it into a more fruitful relation with the science of preventive medicine, is widely recognized. It may be that this is the first necessary step toward the recognition of a place for specialists who hold degrees from graduate schools of the universities.

If we are to get the benefit from this provoking study it is not just the

"sensible" opinions that we must understand. We shall get most benefit by absorbing those opinions that are to us perverse and conservative which nevertheless are held sincerely by men of leadership and culture and which constitute an important element in the total situation to which any program of public health will have to adapt itself.

J. ROSSLYN EARP

Into This Universe—The Story of Human Birth—*By Alan Frank Guttmacher, M.D. New York: The Viking Press,* 1937. 366 pp. Price, $2.75.

A number of books have appeared within the last decade dealing with obstetric and prenatal care. None of those coming to my attention has covered the whole field so clearly and precisely as this unique volume.

Dr. Guttmacher frankly approaches his subject from the historical viewpoint, and the historical perspective is preserved from beginning to end. The author modestly states in the Preface that he has "attempted to set forth, in the cramped confines of a single volume, something of the folklore, the history and the scientific facts of birth."

He has done much more than that. He has clothed the complex subject of sex and its normal outcome in procreation in fascinating descriptions thoroughly scientific, absorbingly interesting, and instructive.

The book should be read by every mother and father—actual or prospective. It is well documented as to original sources and has a comprehensive index.

RICHARD A. BOLT

Wills Hospital Eye Manual for Nurses—*By Gladys Elaine Cole, R.N. Philadelphia: Saunders,* 1936. 202 pp., ill. Price, $1.75.

This *Manual,* written specifically for the nurse, is presented in a simple, practical, concise manner. Miss Cole gives the anatomy and physiology of the eye, and instructions for examination, treatment, medication, and preparation for operation. After discussing in some detail the diseases of the eye, she instructs the nurse as to symptoms, diagnosis, tests, and medical and surgical treatment, always emphasizing the necessary nursing care. The many illustrations and complete table of contents help to make this a most useful handbook.

Although this book would be of special value to the clinical nurse, it would seem that the public health nurse might find it quite useful to have in her library as a source of reference.

LUCY GORDON WHITE

Weight - Lifting by Industrial Workers—*Foreword by E. P. Cathcart. Home Office Safety Pamphlet No. 16, H. M. Stationery Office, London,* 1937. 44 pp. Price, $.45.

This pamphlet (procurable through the British Library of Information, 270 Madison Avenue, New York) discusses the relation of weight-lifting to accidents, better weight-lifting, special consideration of certain industries, and the influence of other factors such as food, temperature, and ventilation. A brief bibliography is attached, also an Appendix covering statutory limitations of loads in Great Britain and a considerable number of half-tones and schematic drawings. Previously, Cathcart and others had taken up the question of the "optimum load" with relation to the physique of women in industry (which is reviewed). Workers should be considered individually in the matter of weight-lifting while various groups of workers may have different reactions. Boys in particular must be guarded, due to their anxiety to prove their strength. Sound methods of lifting and carrying are described. The principles are gen-

erally applicable to both sexes. The natural rhythm of the body and its relation to rest pauses is also important. Not only the weight of the single load should be considered, but the quantity per diem as well as vertical lifting and from what level. The pamphlet is terse in statement and should be read in its entirety by all those interested.

EMERY R. HAYHURST

Child Care and Training — *By Marion L. Faegre and John E. Anderson* (4th ed.). *Minneapolis: University of Minnesota Press,* 1937. 325 pp. Price, $2.50.

This very helpful book has been revised thoroughly and brought right up to date. It reveals that the authors have kept in intimate touch with modern developments in child care and training.

The chapter on "Social Development" is one of the best we have seen. It is a timely presentation of the various adjustments children need to make in their social behavior.

The chapters on habits form an essential part of this volume and offer reasonable suggestions in the solution of perplexing problems. It is hopeful in this period of educational uncertainty that the authors believe in "constructive discipline", and express their faith in practical ways for parents to apply our knowledge of child psychology. The suggestions set forth on page 190 may be taken as our modern code for child guidance.

In their treatment of the subject the authors have preserved a judicious balance between the physical, mental, emotional, and social factors. Each chapter concludes with a selected reference list of books and pamphlets. The University of Minnesota Press is to be commended for the attractive and convenient arrangement of each part of the book. RICHARD A. BOLT

Die aktive Schutzimpfung gegen Diphtherie und die Ergebnisse der in den Jahren 1934 und 1935 in Deutschland durchgeführten Diphtherieschutzimpfungen — *By Max Gundel. In Veröffentlichungen aus dem Gebiete des Volksgesundheitsdienstes, Heft 416, Berlin, R. Schoetz,* 216 pp., 22 figs. in text. 1936. Price M. 9.80.

Of 353,722 children in the areas under consideration, 315,544, or 89.2 per cent, were inoculated in about 10 months during a flare of diphtheria in Germany. A sharp decline in both morbidity and mortality from diphtheria, especially after the building up of the protective action, followed in all of the regions in which inoculations were made, regardless of season. In a few instances there was a decline without inoculation. The decline was greater, more rapid, and to a lower minimum in some areas than in others, especially in those in which the epidemic had continued for a year or more. The decline in mortality was even greater than that in morbidity. The numbers are so large that the probability of error is relatively small.

A comparison of morbidity during 10 months prior to inoculation with that during 10 months after the active protective inoculation was in effect showed a reduction of cases of illness due to diphtheria from 9,979 to 3,623, or to about one-third. Deaths fell off from 517 to 125 or nearly to one-fourth. The reductions were greater in fact because cases of disease or deaths of persons outside of the age limits of inoculation were included in the totals. The mortality of the sick fell off from 5.18 to 3.45 per cent, or 1.73 ± 0.38 per cent. The intensity of the antidiphtheria campaign and better medical care during the campaign, together with the detection of light cases tended to reduce the contrast between the two periods.

Two and 3 inoculations were more effective than 1. Morbidity in 2,968 persons with 1 toxin-antitoxin-flocules inoculation was 1.2 per cent, in 14,730 persons with 2, 0.8 per cent, and in 87,012 persons with 3, 0.4 per cent. With toxin-antitoxin in 2,139, 2,360, and 20,830 persons it was 1.7, 0.6, and 0.7 per cent, respectively With formol-toxoid, these percentages were 1.4, 1.6, and 1.0, in 16,122, 26,193, and 59,643 persons, respectively.

Morbidity in non-inoculated and inoculated children 1 to 6 years of age was 2.4 and 1.2 per cent, respectively, while in children from 6 to 14 years of age it was 3.4 and 0.6 per cent, respectively. Non-inoculated school children are thus more susceptible than non-inoculated younger children and inoculated younger more than inoculated older children.

Deaths among 38,178 non-inoculated children were 98, or 0.26 per cent, but in 313,544 children inoculated 1 to 3 times there were 59 deaths, or only 0.018 per cent, while in the group of 231,662 children with 3 inoculations there were only 23 deaths, or 0.009 per cent. The author concludes that active immunization is the most valuable weapon in endemic and epidemic diphtheria for the protection of children from disease and death.

CHARLES A. KOFOID

The Last Thirty Years in Public Health: Recollections and Reflections on My Official and Post-Official Life—*By Sir Arthur Newsholme, K.C.B., M.D., F.R.C.P. London: George Allen & Unwin, Ltd.*, 1936. 410 pp. Price, 15 s. net.

This is the second volume of Sir Arthur's memoirs. Its appearance will be welcomed in America, as was the preceding volume (*Fifty Years in Public Health*), if for no other reason than because nearly half is devoted to his experiences on this side of the Atlantic and his recollections of American public health and social work. There is, however, a more compelling reason why this second installment of Sir Arthur's memoirs will command American attention: it deals, in large measure, with a number of subjects which were frontiers of British public health progress in the generation past and which are now become (or becoming) central points in our own interests.

Some of our social issues of today were Britain's 20 years ago. Whoever doubts this in public health, need but inspect even casually the topics in the chapter-heads of Part One (Official Life in Whitehall).

The value of these memoirs may be illustrated by a single point. Under the courageous and skillful leadership of Dr. Parran, 1936 was made notable in American public health by the destruction of that obscurantism which has impeded efforts to deal with syphilis as a communicable (instead of a "social") disease. We are now beginning to wrestle with the problems involved in the organization of treatment facilities. In Britain, under Sir Arthur's leadership, a substantial and effective basis was laid, as long ago as 1913–1917, for the gratuitous and confidential treatment of all applicants and this was effected by the central and local governments with the coöperation of the British Medical Association. It is almost needless to add that the analysis of the problem, the arguments —*pro* and *con*—on the choice of procedures, etc., reviewed here by Sir Arthur, should be pondered by American leaders.

Part Two, American recollections, runs the gamut from The Red Cross in Peace Time, through Health Problems in Tropical Medicine. Sir Arthur knows American public health from critical reading of its history, from

visits to many parts of the land, and from his years on the faculty of the School of Hygiene and Public Health at Johns Hopkins. Welch, Garrison, Sedgwick, Biggs, Chapin, Howell, and many others, march across the pages. Trenchant observation, mature judgment, and a not-too-dry humor color everything.

Part Three (The Increasing Socialization of Medicine) reviews critically Sir Arthur's European studies, analyzes the work of the (American) Committee on the Costs of Medical Care, presents a (less than full length) portrait of two (the "British" and "American") National Medical Associations: A Contrast, and reviews Soviet and other national medical services.

Sir Arthur writes casually and never ponderously. The book is packed with observations on the history, evolution, and administrative solution of public health problems.

Though making no pretense to identify the American with the British scene, much that happened in British public health explains what happened in the United States. There is a common thread between their institutions and ours. These reminiscences explain many of our practices, while helping us to solve those problems in which Britain has anticipated us. Readers of this volume will hope for a subsequent one from the same pen.

I. S. FALK

BOOKS RECEIVED

MUNICIPAL AND RURAL SANITATION. By Victor M. Ehlers and Ernest W. Steel. 2d ed. New York: McGraw-Hill, 1937. 477 pp. Price, $4.00.

HOW TO INTERPRET SOCIAL WORK. A Study Course. By Helen Cody Baker and Mary Swain Routzahn. New York: Russell Sage, 1937. 79 pp. Price, $1.00.

LIFE AND DEATH. The Autobiography of a Surgeon. By Andrea Majocchi. New York: Knight, 1937. 300 pp. Price, $2.75.

PHYSIOLOGICAL HYGIENE. By Cleveland Pendleton Hickman. New York: Prentice-Hall, 1937. 493 pp., ill. Price, $3.25.

HANDBOOK OF MICROSCOPICAL TECHNIQUE. Edited by C. E. McClung. 2d ed. New York: Hoeber, 1937. 698 pp. Price, $8.00.

THE HEALTH EDUCATION YEAR BOOK, 1937-1938. By the Central Council for Health Education, London, 1937. 139 pp. Price, $1.50.

A TEXTBOOK OF GYMNASTICS. By K. A. Knudsen. Philadelphia: Blakiston, 1937. 364 pp., ill. Price, $3.00

BUTTER AND OLEOMARGARINE: An Analysis of Competing Commodities. By W. R. Pabst, Jr. New York: Columbia University Press, 1937. 112 pp. Price, $1.50.

PUBLIC HEALTH: WAYS AND MEANS OF PREVENTION OF INFECTIOUS DISEASES (in Hebrew). By Dr. Abraham J. Levy. Tel Avid, Palestine: "Achiever," 1935. 318 pp., 66 ill. Price, $1.50.

SANITATION: A MANUAL FOR THE CARE OF FOOD AND DRINK AND FOR INSTITUTING HEALTHY SANITARY CONDITIONS WITHIN AND WITHOUT THE HOME (in Hebrew). By Dr. Abraham J. Levy. Tel Aviv, Palestine: "Achiever," 1936. 319 pp., 75 ill. Price, $1.50.

FIRST AID: A MANUAL FOR EVERY INDIVIDUAL (in Hebrew). By Dr. Abraham J. Levy. Jerusalem, Palestine: Reuben Mass, 1936. 377 pp., 114 ill. Price, $1.50.

A WORKBOOK IN HEALTH FOR HIGH SCHOOL GIRLS. By Gladys B. Gogle. New York: Barnes, 1937. 267 pp. Price, $1.00

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Declining Birth Rates—How our declining birth rate will affect agriculture and American economics is gloomily portrayed. As the preponderance of urban population turns to a preponderance of rural population, demand for agricultural products will decrease and farms will degenerate from a commercial to the subsistence level. The solution lies in inculcating a national spirit of sacrifice, the author holds.

BAKER, O. E. Significance of Population Trends to American Agriculture. Milbank Quart. 15, 2:121 (Apr.), 1937.

Who Is Immunized?—Surveying the health of 8,700 white families, a record was kept of the immunizations that the 40,000 persons had received. Large cities had twice as many smallpox vaccinations as rural regions, whereas rural groups were vaccinated for typhoid twice as frequently as city people. Before 5 years, diphtheria immunization exceeded smallpox, but after 5 years, smallpox vaccination was greater.

COLLINS, S. D. Frequency of Immunizing and Related Procedures in Nine Thousand Surveyed Families in Eighteen States. Milbank Quart. 15, 2:150 (Apr.), 1937.

Is Cancer Increasing?—Though cancer is second in causes of death, it displaces the 5 diseases that formerly preceded it because they have declined in incidence. Half the reported cancers are of the digestive tract; a third are of the female breast and genital organs. Increases in rates are largely limited to males over 45. Probably the apparent increase that is not attributable to the aging population is due to improvement in diagnosis and reporting. An excellent and reassuring summary.

DUBLIN, L. I. Statistics of Morbidity and Mortality from Cancer in the United States. Am. J. Cancer, 29, 4:736 (Apr.), 1937.

Smallpox Vaccination Studies—Experience in Spain confirms American studies of the value of subcutaneous smallpox vaccination using virus cultivated *in vitro* or on chick embryo.

GALLARDO, E., and SANZ, J. Subcutaneous Smallpox Vaccination With Bacteria Free Vaccine. Am. J. Hyg. 25, 2:354 (Mar.), 1937.

School Health Services—In Detroit teachers in public and parochial schools are taught to make health inspections of their charges. Children found with defects are referred to school physicians who take up the matter of correction with parents. The results have been successful.

GUDAKUNST, D. W. School Health Inspection by Teachers. Milbank Quart. 15, 2:139 (Apr.), 1937.

Incidence of Trichinosis—As this sampling indicates a 15 per cent incidence of trichinosis among the residents of Washington, it is recommended that an examination of a press preparation of 1 gram of diaphragm muscle be made a routine procedure in all postmortem examinations.

HALL, M. C., and COLLINS, B. J. Studies on Trichinosis. Pub. Health Rep. 52, 17:512 (Apr. 23), 1937.

For Sanatorium Graduates—One whole issue of this vocational guidance magazine is given over to the many

aspects of the tremendously important subject of the rehabilitation for the ex-tuberculosis patient. Every health worker should possess some information on this matter and this is one good place to get it.

LEE, E. A., *et al.* The Social and Vocational Rehabilitation of the Tuberculous. Occupations. 15, 7:581 (Apr.), 1937.

For Expectant Mothers in Rural Sections—Details about the operation of a small town maternity nursing center in a Western state will stimulate interest in the possibilities in this procedure in all sections of the country.

MOORE, A. R. A State Maternity Demonstration Center. Pub. Health Nurs. 29,4:219 (Apr.), 1937.

For Ontario School Children—How the school health educational program was changed from one of "lectures" by the school medical service staff to an educational system carried on by the ones who should do the teaching, the teachers, is interestingly told in historical detail.

PHAIR, J. T., *et al.* An Experiment in Health Teaching in Ontario. Canad. Pub. Health J. 28, 4:166 (Apr.), 1937.

Vaccination Against Yellow Fever—For the protection of laboratory workers, a yellow fever vaccine following immune human serum has been found effective and the immunity persists up to 4 years.

SAWYER, W. A. Experience in Vaccinating Against Yellow Fever with Immune Human Serum and Virus Fixed for Mice. Am. J. Hyg. 25, 2:221 (Mar.), 1937.

Telling Youngsters About Tuberculosis—Many sanitarians will be interested in the national program for teaching high school students about tuberculosis and its prevention and the relationship of the educational project to the school case finding program.

SHAW, F. B., and STRACHAN, L. Preventing Tuberculosis in High Schools. J. Health & Phys. Education. 8, 3:136 (Mar.), 1937.

Voluntary and Official Nursing Services—Relative spheres of activity for the health department nursing staffs and those of the nursing associations in meeting the mounting needs for nursing care is the subject of this stimulating discussion of one city's problems.

WINSLOW, A. R. The Private Agency in Today's Health Problem. Pub. Health Nurs. 29, 4:204 (Apr.), 1937.

ASSOCIATION NEWS

Sixty-sixth Annual Meeting
American Public Health Association

New York, N. Y.
October 5-8, 1937

Headquarters

THE Hotels Pennsylvania, New Yorker, and McAlpin have been named by the Program Committee as meeting and residence headquarters. Next month the room rates of these and a number of other selected hotels will be published with a reservation blank. Delegates are urged to reserve rooms as soon as possible, since an expected attendance of 4,000 will tax the facilities of the headquarters group.

Health Education Institute

THE Public Health Education Section has just issued an announcement of the Fifth Institute on Health Education to be held in connection with the Association's 66th Annual Meeting. The Institute will be held on Sunday, October 3, Monday, October 4, and Tuesday, October 5. Special courses are offered on personal contact, newspapers, meetings, campaign methods, printed matter, radio, visual methods and school.

The faculty will include:

Professor Ira V. Hiscock, *Director*
Mary P. Connolly
Mary Swain Routzahn
Philip R. Jacobs, Ph.D.
H. E. Kleinschmidt, M.D.
Bertrand Brown
Mrs. W. W. Bauer
Ruth Grout
C. E. Turner, Ph.D.
Homer N. Calver
Evart G. Routzahn

The registration fee is $3.00 for members and $5.00 for non-members. A prospectus will be sent on request.

Scientific Exhibits

THE Committee on Scientific Exhibits will welcome applications for space for:

1. Visual Presentation of:
 (a) Results of statistical, laboratory, or other research
 (b) Administration organization or methods
 (c) Community or individual health conditions, needs or services
 (d) Statistical, laboratory or other data, etc.
2. Devices or technics used in health administration, sanitary control, vital statistics, laboratory work, or other phase of the operation of a health department or voluntary agency
3. Professional teaching material: for the health agency staff, or the professional school
4. Material of historical or biographical interest

Such exhibit space is provided by the Association without charge. Application must be made on the form prescribed by the committee which may be obtained from this office.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Guillermo Arbona, M.D., Maricao, P. R., Public Health Officer, Dept. of Health, P. R.

Forrest J. Austin, M.D., Rice Bldg., Houghton, Mich., Director, Houghton-Keweenow District Health Department

Richard S. Austin, M.D., Cincinnati General Hospital, Cincinnati, O., Member, Board of Health

Lewis S. Barger, M.D., Box 5, Golconda, Ill., District Health Superintendent

James M. Barnett, M.D., Albany, Ga., Member, Dougherty County Board of Health

J. Jeff Billington, M.D., 521 N. Boulder, Tulsa, Okla., City Superintendent of Health

Henry H. Bishop, M.D., Burkesville, Ky., Health Officer, Cumberland County

Edwin Cameron, M.D., New Martinsville, W. Va., Health Officer, Wetzel County

Andrew J. Cauthen, M.D., W. Dunlap St., Lancester, S. C., County Health Officer

Archie I. Cullen, M.D., Altamont, N. Y., Health Officer

Lee H. Curran, M.D., P. O. Box 572, Omak, Wash., Medical Officer, U. S. Indian Service

Arellin Dalcourt, M.D., St. Laurent, Louiseville, P. Q., Canada, Medical Officer, Maskinonge County

Walter W. Debele, 239 Somerset St., North Plainfield, N. J., Health Officer

Nettie M. Dorris, M.D., 214 S. Central Ave., Paris, Ill., District Health Superintendent

Lewis N. Eames, M.D., 223 N. Washington St., Rome, N. Y., Health Officer

Walter J. Farrell, M.D., Phar.D., 301 Main St., Johnson City, N. Y., Health Officer

O. David Garvin, M.D., Ridge Spring, S. C., District Health Director

Lloyd H. Gaston, M.D., Sandusky, Mich., Director, Sanilac County Health Dept.

C. R. Markwood, M.D., Whitley City, Ky., McCreary County Health Officer

L. Walter Naus, M.D., 112 W. Johnson St., Upper Sandusky, O., County Health Commissioner

K. W. Navin, M.D., Philip, S. D., Director, First District Public Health Unit

James H. Pearce, M.D., Georgetown, S. C., County Health Officer

Daniel Rakov, M.D., Walden Rd., Maybrook, N. Y., Health Officer

David Rodier, M.D., Hunter, N. Y., Health Officer

S. C. Rutland, M.D., P. O. Box 25, LaGrange, Ga., Troup County Health Officer

Harry A. Sauberli, M.D., Sevierville, Tenn., Director, Sevier County Health Dept.

Harold D. Sehl, M.D., South St., Clark Mills, N. Y., Health Officer

Richard C. Shepard, M.D., LaFayette, Ga., County Commissioner of Health

Clarence E. Sherwood, M.D., 107½ Egan Ave. S., Madison, S. D., City Health Officer

Eugene H. Silverstone, M.D., 615 N. Wolfe St., Baltimore, Md., Student at present; on leave from U. S. Indian Service

Adam Stacy, Jr., M.D., 210 Riverway, Boston, Mass., Student at present; Bell County Health Officer, Pineville, Ky.

Charles N. Stanhope, M.D., Municipal Bldg., Dover-Foxcroft, Me., District Health Officer

A. L. Stone, M.D., City Hall, Camden, N. J., Director of Public Health

John Weiss, M.D., 22 Market St., Ellenville, N. Y., Health Officer

Herbert B. Wise, M.D., City Hall, Charleston, W. Va., City Health Commissioner

Laboratory Section

Hyman M. Charm, Sc.D., 1018 E. 163 St., New York, N. Y., Director of Clinical Laboratory

Almond D. Davison, 14th Ave. & Lake St., San Francisco, Calif., Technician, U. S. Public Health Service Laboratory

Samuel S. Epstein, Ph.D., 33 Keap St., Brooklyn, N. Y., Director, Research Dept. of Bacteriology, Camel Lead, Color and Chemical Products Mfg. Corp.

Thomas S. Gilchrist, 72 Melrose Ave., Toronto, Ont., Canada, Production Manager, Acme Farmers Dairy Ltd.

Helen V. Karr, 525 E. 68 St., New York, N. Y., Research Bacteriologist, New York Hospital

Edward T. Mallett, 8th & Walnut Sts., Evansville, Ind., Dairy Bacteriologist, Ideal Pure Milk Co.

Harold W. Morgan, M.D., 84 Beaumont Dr., Mason City, Ia., Director, Laboratories and X-ray, St. Joseph's Mercy Hospital

Louis Nerb, Ph.D., 121 DeKalb Ave., Brooklyn, N. Y., Bacteriologist, Brooklyn Hospital

Mary P. Salisbury, 1108 Bath Ave., Ashland,

Ky., Laboratory Technician, Boyd County Health Dept.

Zelma Zentmire, 118 E. Market St., Iowa City, Ia., Associate Bacteriologist, State Hygienic Laboratories

Vital Statistics Section

Gladys G. Casady, State Dept. of Health, St. Paul, Minn., Field Agent and Mortality Editor, Division of Vital Statistics

Marcella B. Graham, City Hall, Oakland, Calif., Deputy Registrar of Vital Statistics, Dept. of Health

David E. Hailman, 6072 Harrell Ave., Detroit, Mich., Supervisor, Medical Coding, U. S. Public Health Service—Health Survey

Public Health Engineering Section

William L. Avrett, Jr., 920 Highland Terrace, N.E., Atlanta, Ga., Assistant Engineer, State Board of Health

John B. Black, C.E., Dublin, Ga., Assistant Division Engineer, State Board of Health

Nathan M. de Jarnette, 1114 Alta Ave., N.E., Atlanta, Ga., Assistant Sanitary Engineer, State Board of Health

Charles E. Duncan, Box 142, Sparta, Ga., District Sanitary Engineer, State Dept. of Health

Charles A. Farish, State Board of Health, Columbia, S. C., Sanitary Inspector

David C. Fowler, 135 State Capitol, Atlanta, Ga., Division Sanitarian, State Board of Health

Robert J. Gleason, 224 E. 47 St., New York, N. Y., Project Supervisor, Federal Plumbing Inspection

Carlos A. Guardia, Apartado Postal 1175, Caracas, Venezuela, S. A., Sanitary Engineer, Ministry of Public Health

John L. Hummel, 814 N. Monroe St., Albany, Ga., Director, Malaria Control and Sanitary Engineering, Dougherty County Board of Health

William R. Jones, 300 S. Broadway, Wichita, Kans., Sanitarian, State Board of Health

Lester M. Klashman, 10 Turnpike St., Canton, Mass., Student

William R. Latham, Jr., P. O. Box 623, Fort Valley, Ga., District Supervisor, Engineering Division, State Board of Health

Benn J. Leland, Dept. of Public Health, Springfield, Ill., Sanitary Engineer, State Dept. of Public Health

Jack B. Nickel, 201 State House Annex, Indianapolis, Ind., Assistant Engineer, State Board of Health

Forrest W. Rhodes, C.E., State Capitol, Atlanta, Ga., Division Engineer, State Board of Health

R. T. Richey, Box 445, Victoria, Tex., District Sanitary Engineer, State Dept. of Health

Fred A. Safay, Box 210, Jacksonville, Fla., Director, Bureau of Sanitation, State Board of Health

Gerrit A. Schroeyers, C.E., 6 Montebello-street, Antwerp, Belgium, Engineer, Antwerp Waterworks

William B. Snow, Box 105, Dawson, Ga., Supervisor, Sanitary Engineering Division, State Board of Health

William C. Tebay, City-County Health Dept., Wheeling, W. Va., State District Milk Inspector

William G. Weller, Sevierville, Tenn., Sanitarian, Sevier County Health Dept.

H. F. Wiedeman, C.E., 1404 Candler Bldg., Atlanta, Ga., Consulting Engineer

Industrial Hygiene Section

Philip E. Fisher, Bureau of Industrial Hygiene, Dept. of Health, Detroit, Mich., Sanitary Engineering Aide

Iwao M. Moriyama, Ph.D., C.P.H., 290 Congress Ave., New Haven, Conn., Research Engineer, John B. Pierce Laboratory of Hygiene

Edmond T. Roetman, State Health Dept., Charleston, W. Va., Assistant Industrial Hygiene Engineer

Dorothea H. Scoville, M.D., 40 Channing St., New London, Conn., Physician, Connecticut College

Food and Nutrition Section

Morris Bruckman, 1730 Andrews Ave., New York, N. Y., Inspector of Foods, Dept. of Health

Jules S. Cherniak, 510 W. 110 St., New York, N. Y., Inspector of Foods, Dept. of Health

Grant M. Dickerson, 36 Witter Ave., Wellsville, N. Y., Inspector of Foods, New York City Dept. of Health

Harold S. Pierce, 611 E. Second St., Brooklyn, N. Y., Inspector of Foods, Dept. of Health

Joseph J. Schiftner, 6250 Saunders St., Rego Park, N. Y., Inspector of Foods, New York City Dept. of Health

William H. Sebrell, Jr., M.D., National Institute of Health, Washington, D. C., P. A. Surgeon, U. S. Public Health Service

John M. Sharf, 224 Southern Bldg., Washington, D. C., Technical Service Director, American Bottlers of Carbonated Beverages

Louis Yonofsky, 1662 Cropsey Ave., Brooklyn, N. Y., Food Inspector, Dept. of Health

Child Hygiene Section

Augustine W. McGarry, M.D., 482 Commonwealth Ave., Boston, Mass., Medical Inspector, City Health Dept.

Nathan Millman, M.D., 404 Avenue C, Brooklyn, N. Y., School Medical Inspector, Dept. of Health

John M. Saunders, M.D., C.P.H., State Health Dept., Nashville, Tenn., Associate Director, Maternal and Child Hygiene

Public Health Education Section

Miriam M. Ferguson, M.D., 75 Maple, Hornell, N. Y., Medical Inspector, Public Schools

Vernon D. Irwin, D.D.S., Millard Hall, Univ. Campus, Minneapolis, Minn., Superintendent, Dental Health Education, State Dept. of Health

Mildred F. Patterson, Savannah, Tenn., Clerk, Hardin County Health Dept.

Alton Richards, 29–33 165 St., Flushing, N. Y., Hygiene Teacher, College of the City of New York

Walter G. Saunders, M.D., D.P.H., North Vancouver, B. C., Canada, Director, North Vancouver Health Unit

Frederick G. Scovel, M.D., P'ai Fang St., Tsining, Shantung, China

Public Health Nursing Section

Rosa V. Anderson, R.N., P. O. Box 514, Albany, Ga., District Supervising Nurse, State Board of Health

Lodema J. Brown, R.N., c/o Walker, Pokatello, Idaho, Public Health Nurse, Bannock County Health Unit

Margaret D. Ford, R.N., 914 Highmarket St., Georgetown, S. C., County Nurse, Georgetown County Health Dept.

Ruth G. George, R.N., 2129 Santee Ave., Columbia, S. C., Public Health Nursing Consultant, State Board of Health

Margaret L. Giles, Flovilla, Ga., District Advisory Public Health Nurse, State Board of Health

Edna S. Gould, R.N., Marlette, Mich., Staff Nurse, Sanilac County Health Dept.

Alice O. Helseth, Highlands County Health Dept., Sebring, Fla., County Nurse

Anna T. Hooley, State Office Bldg., Albany, N. Y., Assistant Director, Division of Public Health Nursing, State Dept. of Health

Clara P. Howard, Box 475, Preston, Idaho, Staff Nurse, State Division of Health

Lydia H. Keller, R.N., Martin, S. D., County Public Health Nurse

Gretel R. Kepner, P. O. Box 3119, Honolulu, T. H., Public Health Nurse, Palama Settlement

Minnie H. Lathrop, P. O. Box 537, Waycross, Ga., District Tuberculosis Nurse, State Dept. of Health

Idonna Nuttall, R.N., 809 W. Center, Pocatello, Idaho, Public Health Nurse, Bannock County Health Unit

Hilda K. Pedley, 312 F Ohua, Honolulu, T. H., Public Health Nurse, Board of Health

Ruth E. Peters, 157 N. Ranney, S. Keston, Mo., Public Health Nurse

Nora R. Rolf, 1423 W. 26 St., Minneapolis, Minn., Field Advisory Nurse, State Board of Health

Epidemiology Section

Abraham D. Rubenstein, M.D., 30 Lawton Ave. Lynn, Mass., Epidemiologist, State Dept. of Health

Irving Teitelbaum, M.D., 279 Hinsdale St., Brooklyn, N. Y., Clinic Physician, Dept. of Health (WPA)

Ralph Gregg, M.D., P. O. Box 57, Gallipolis, O., Passed Assistant Surgeon, U. S. Public Health Service

Wilfrid L. J. McDonald, M.D., State Dept. of Health, Albany, N. Y., Epidemiologist-in-training

Bernard M. Blum, M.D., State Dept. of Health, Albany, N. Y., Epidemiologist-in-training

Harold W. Brown, M.D., Sc.D., Dr.P.H., Malaria Research Laboratory, Savannah, Ga., Passed Assistant Surgeon, U. S. Public Health Service

Donald V. Cooney, M.D., 41–13–157 St., Flushing, N. Y., Epidemiologist-in-training, State Dept. of Health

John M. Wheelis, Jr., M.D., Bureau of Medicine & Surgery, Washington, D. C., Medical Officer, U. S. Navy

Unaffiliated

Florence V. Ralston, M.D., 247 Mt. Hope Place, New York, N. Y., Supervising Medical Inspector, Dept. of Health

Clair E. Trontman, M.D., 55 S. Main, Marion, N. Y., Student

AMERICAN MUSEUM OF HYGIENE

GRANTS from the Carnegie Corporation of New York and the Josiah Macy, Jr. Foundation have been made to the Association for the general purposes of its Committee on American Museum of Hygiene. This committee was created by the Executive Board in 1931 to carry out the policies of the Association which were expressed by a general Association resolution at its Annual Meeting in 1930.

Working under these grants the committee will undertake the basic studies which will serve as a guide to the groups in several cities which are now considering the establishing of such institutions. In addition, the Association committee, working in collaboration with the Advisory Committee on Medicine and Public Health for the New York World's Fair, will undertake the development of the medical and public health exhibits for the Fair with the expectation that some of these exhibits may become part of a permanent museum of hygiene.

Homer N. Calver, formerly Executive Secretary of the Association, and the secretary of the committee, has been appointed to direct this work.

Benjamin C. Gruenberg, Ph.D., has been appointed temporarily as research consultant.

EXTENSION OF THE RURAL HEALTH CONSERVATION CONTEST TO CANADA

ARRANGEMENTS have been completed for the inclusion of Canada in the Rural Health Conservation Contest which is financed by the W. K. Kellogg Foundation and is conducted annually by the Chamber of Commerce of the United States and the American Public Health Association. This will make possible the participation in the Contest of all full-time health units existing in the Dominion. For the present, Canada will be considered as one district so that Canadian units will compete only against other units in Canada. At the present time, there is a total of 47 health units under full-time service in the different Provinces, viz: 4 in British Columbia, 2 in Alberta, 3 in Manitoba, 1 in Ontario, 31 in Quebec, 5 in New Brunswick and 1 in Prince Edward Island.

The enrollment of Canadian units is to be made through the Canadian Public Health Association which is coöperating with the American Public Health Association, but the office and field service for Canada will be from the American Public Health Association just as it now is for the United States.

It is expected that this extension of the Contest will be of definite service to the Canadian provinces, and further cement the good will and interchange of ideas which have so long existed between the United States and the Dominion in their public health activities.

RESOLUTION ON THE DEATH OF GUSTAV OBERLAENDER *

WHEREAS the Committee on the American Museum of Hygiene of the American Public Health Association and the entire field of public health has suffered a distinct loss in the passing of Gustav Oberlaender, founder of the Oberlaender Trust; and

WHEREAS through his vision, his beneficence, and his keen appreciation of social and human values he has exerted a wide and lasting influence on the public welfare, now be it

RESOLVED that this resolution be entered in the permanent records of the Committee on the American Museum of Hygiene and that copies be sent to his widow, to the Surgeon General of the United States Public Health Service, and to the Directors of the Oberlaender Trust.

* Adopted by the Committee on American Museum of Hygiene of the American Public Health Association at a meeting held on April 2, 1937.

NEWS FROM THE FIELD

NEW HEALTH CENTER IN NEW YORK

MAYOR Fiorello H. LaGuardia of New York City laid the cornerstone of the Kips Bay-Yorkville Health and Teaching Center, 411 East 69 Street, after a civic luncheon held at the New York Hospital, May 10. In speaking on the occasion, John L. Rice, M.D.,* Commissioner of Health, pointed out that this was a coöperative plan through which health and teaching centers would be set up in connection with the five medical schools in Metropolitan New York, and closely integrated with the work of the thirty health districts. Under this program it is proposed that medical colleges would offer students courses in public health practice and preventive medicine much closer to reality than before.

This is the ninth building which has been started under the plan of the New York City Department of Health to create thirty full-time health districts through which the activities of the City Department of Health would be handled on a decentralized program. Other speakers included Wilson G. Smillie, M.D.,* Professor of Public Health-elect, Cornell University Medical College, James Alexander Miller, M.D., President of the New York Academy of Medicine, Bailey B. Burritt,† Chairman of the District Health Committee, and Livingston Farrand, M.D.,* President of Cornell University.

MEDICAL COLLEGE OF VIRGINIA SUMMER SCHOOL

THE 1937 Saint Philip Post-graduate Clinic for Negro Physicians (for physicians from all states) is to be held at the Medical College of Virginia, Richmond Va., June 14–26.

SAFETY CONTEST WINNERS

THE first prize in the Fifth Annual Traffic Safety Contest conducted by the National Safety Council for 1936 was won by New York City; 1,013 cities took part in the contest. New York City was also first in the group of cities of populations larger than 500,000; Milwaukee was the winner in this group in 1935.

First places in other population groups were as follows: Kansas City, Mo., cities from 250,000 to 500,000; Omaha, cities from 100,000 to 250,000; Jackson, Mich., cities from 50,000 to 100,000; West New York, N. J., cities from 25,000 to 50,000; Wilmette, Ill., cities from 10,000 to 25,000. The judges named a special honor roll of 139 cities that had passed the year without a single traffic fatality. West New York was the largest of these.

New York had 838 traffic accident deaths, 12.2 per cent lower than its 1935 total of 954, and 17 per cent lower than the average total for the three preceding years. . . .—*J.A.M.A.*, April 17, 1937, p. 1350.

MARYLAND CONFERENCE

THE Seventeenth Annual Conference of Health Officers and Boards of Health of Maryland was held on May 14 at the Johns Hopkins School of Hygiene and Public Health. The program was devoted largely to the discussion of current problems of communicable disease control and to measures for the promotion of the health of mothers and young children through federal and state coöperation.

Presiding officers were: R. H. Riley, M.D., Dr.P.H.,* Director of the State Department of Health, and Huntington Williams, M.D., Dr.P.H.,* Health Commissioner of Baltimore.

* Fellow A.P.H.A.
† Member A.P.H.A.

YELLOW FEVER VOLUNTEER DIES

CHARLES G. Sonntag, of Jackson, S. C., one of the volunteers who submitted to inoculation with yellow fever through mosquito bites in the experiment conducted by Major Walter Reed in Cuba in 1900–1902, recently died, at the age of 64.

He has been a farmer for many years. In 1931 he received a gold medal authorized by Congress in recognition of his service in the yellow fever experiment.

BOARD TO RECOMMEND HEALTH OFFICERS

MAYOR Fiorello H. LaGuardia of New York City, President of the United States Conference of Mayors, has appointed a board to recommend public health officers for appointment.

Joseph W. Mountin, M.D.,* of the U. S. Public Health Service, Washington, D. C., is chairman of the board. Other members are: Allen W. Freeman, M.D.,* of Baltimore; Wilson G. Smillie,* of Boston; Huntington Williams, M.D.,* of Baltimore, and John L. Rice, M.D.,* of New York.

PNEUMONIA AND VENEREAL DISEASE STUDIES

A COMMISSION has been appointed by the Medical Society of the State of Pennsylvania, Erie, Pa., for the study of pneumonia control. A commission has also been appointed on the control of syphilis and venereal diseases.

WILL ROGERS MEMORIAL HOSPITAL

THE former National Vaudeville Artists Sanatorium at Saranac Lake, N. Y., became officially the Will Rogers Memorial Hospital on February 25, when Will Hays presented the deed to Jesse H. Jones, Treasurer of the Will Rogers Memorial Commission.

PROPOSED NATIONAL DEPARTMENT OF HEALTH

THE Michigan State Medical Society adopted a resolution recommending, in the event of any reorganizing process affecting the U. S. Public Health Service, the creation of a department of public health in the national government, to include all activities in the field of preventive medicine now performed by the various departments. This action was taken in support of a similar action of the Board of Trustees of the American Medical Association at a meeting early in January. The society further recommends that the supervision and direction of such a department should be in the hands of a competently trained physician, experienced in executive administration.—*J.A.M.A.*, April 10, 1937, p. 1268.

ENGINEERING LIBRARY

ON May 7, the John H. Gregory Sanitary and Municipal Engineering Reference Library was opened in Columbus, Ohio. This library comprises the professional volumes of the late John H. Gregory, Professor of Civil and Sanitary Engineering at Johns Hopkins University, Baltimore, who was Consulting Engineer for 22 years with the city of Columbus, Ohio.

INDUSTRIAL HYGIENE LABORATORY

A LABORATORY to carry on scientific and industrial work in chemical, bacteriologic and public health problems was recently incorporated in New York City under the "Laboratory of Industrial Hygiene." William H. Park, M.D.,* is President. The service at present includes units for certified milk, vitamin testing, clinical diagnosis, chemistry, and bacteriology.

* Fellow A.P.H.A.

CANADIAN HEALTH CONSERVATION CONTEST

THE Canadian Public Health Association has arranged to conduct a public health conservation contest for rural areas with full-time health service, in coöperation with the American Public Health Association.

The project in Canada, as in the United States, is financed by a grant from the W. K. Kellogg Foundation.

A fact-finding schedule taken principally from the *Appraisal Form* published by the A.P.H.A. will be used and field service will be furnished from the full-time staff of the A.P.H.A.

The first contest will be held in the spring of 1938. Albert Grant Fleming, M.B.,* of Montreal, is Chairman of the Committee and John T. Phair, M.B., D.P.H.,* of Toronto, is Secretary.

GEORGIA PUBLIC HEALTH ASSOCIATION

THE Georgia Public Health Association held its annual meeting in Atlanta, Ga., April 2–4, with the largest attendance in its history. Great enthusiasm was shown by those engaged in public health work in Georgia over the increased appropriation to the Georgia State Board of Health during the recent session of the Georgia Legislature. Governor E. D. Rivers delivered a talk on the improvement of health conditions throughout the state, and pledged his continued support in securing adequate appropriations.

The first two days were devoted to general papers on public health work, and the last day to round table discussions of the 3 sections—medical, nursing, and engineering.

The following officers were elected for 1937–1938:

Dr. W. W. Brown, *President*
W. H. Weir, *Vice-President*
Dr. M. E. Winchester, *Secretary-Treasurer*

* Fellow A P H A.
† Member A P H A

NATIONAL EDUCATION ASSOCIATION

THE National Education Association will hold its Annual Meeting in Detroit, Mich., *June 28–30*. The program will be concerned particularly with the health of the school child.

Among the speakers will be:

Isaac A. Abt, M.D.*—Northwestern University, Evanston, Ill.
Haven Emerson, M.D.*—College of Physicians and Surgeons, Columbia University, New York, N. Y.
C. H. McCloy, M.D.—President, American Physical Education Association, Ann Arbor, Mich.
John Sundwall, M.D.*—President, School Physicians Association, Ann Arbor, Mich.

PERSONALS

A. R. HEATH, inspector in the bureau of foods, drugs and hotels of the Kentucky State Department of Health, has been appointed as of May 1 to direct the field service of the Public Health Committee of the Cup and Container Institute, New York, N. Y. Mr. Heath, while on leave of absence from the Kentucky department, in his new position will assist local health departments undertaking, or planning to undertake, sanitary programs in public eating and drinking places.

DR. LOUIS LEHRFELD has resigned as Epidemiologist of the Philadelphia Department of Public Health, after 22 years' service.

THOMAS MILTON RIVERS, M.D.,† has been appointed by the Board of Scientific Directors of the Rockefeller Institute for Medical Research, as Director of the Department of the Hospital of the Institute, succeeding Rufus Cole, M.D.,† who will on June 30 reach the age of retirement. Dr. Cole has been Director of the hospital since its founding in 1910. Dr. Rivers was associate in the bacteriological department of Johns Hopkins Medical School before he

became associate in the Rockefeller Institute hospital in 1922.

HARRY S. MUSTARD, M.D.,* Associate Professor of Public Health Administration, School of Hygiene and Public Health, Johns Hopkins University, has resigned to accept the position of Hermann M. Biggs Professor of Preventive Medicine, New York University, effective September, 1937.

WILLIAM H. PARK, M.D.,* Director of Laboratories in the New York City Department of Health, has been awarded the George M. Kober Medal by the Association of American Physicians. Dr. Park was cited for his research work in infectious diseases.

RUFUS COLE, M.D., D.Sc.,† Director of Hospitals of the Rockefeller Institute, was chosen to be the recipient of the medal next year.

EARLE G. BROWN, M.D.,* has been appointed Health Officer of Arlington County, Virginia, effective May 17. Dr. Brown resigned in May as Secretary of the State Board of Health in Kansas and Director of the Division of Public Health Education.

MARY AUGUSTA CLARK,* of The National Committee for Mental Hygiene, New York City, was honored "for signal contribution to Mount Holyoke College" and received a medal specially struck for the occasion. This citation was presented by President Mary E. Woolley at the Centenary Celebration at South Hadley, Mass., on May 7.

BERTHOLD S. POLLAK, M.D.,† for 30 years Medical Director of the Hudson County Tuberculosis Hospital, Secaucus, N. J., is to be Medical Director of a new tuberculosis hospital in the Jersey City Medical Center, now nearing completion.

JAY D. DUNSHEE, M.D.,* Public Health Adviser in the Department of Public Welfare of Idaho, Boise, has been appointed Director of the Division of Public Health, created recently by state legislature.

CARL S. PEDERSON, PH.D.,† Chief of Research in Bacteriology at the New York State Agricultural Experiment Station, Geneva, N. Y., has recently returned from a 3 month leave of absence granted to study fermentation problems in sugar factories located in the province of Camaguey, Cuba.

ROBERT KNOX GALLOWAY, M.D.,† of Franklin, Tenn., recently Health Officer of Williamson County and City Health Officer of Franklin, Tenn., has been appointed Director of Health and Hygiene in the public schools of Nashville.

HESTER B. CURTIS, M.D., M.P.H.,† of the New York State Department of Health, at Albany, N. Y., has been appointed to take charge of the Division of Child Health in the Bureau of Public Health of New Mexico.

ROBERT B. WOLFORD, M.D.,† formerly of Wichita Falls, Tex., has been appointed Director of the Bureau of Communicable Diseases of the Texas State Department of Health.

VERNE K. HARVEY, M.D.,† of Indianapolis, Ind., has been reappointed Director of the Indiana State Board of Health.

DEATH

VICTOR MILDENBERG, M.D.,† of Jamaica, N. Y., died April 13. He was Medical Inspector-in-Charge of the Jamaica districts of the New York Department of Health.

* Fellow A.P.H.A.
† Member A.P.H.A.

CONFERENCES AND DATES

American Academy of Tuberculosis Physicians. Atlantic City, N. J. June 7–8.

American Association for the Advancement of Science. Denver, Colo. June 21–26.

American Association of School Physicians. Annual Meeting in conjunction with Annual Meeting of the American Public Health Association. Hotel Pennsylvania, New York, N. Y. October 5–8.

American College of Surgeons. Chicago, Ill. October 25–29.

American Committee on Maternal Welfare, Inc. Luncheon meeting. Hotel Dennis, Atlantic City, N. J. June 9.

American Dental Association. Atlantic City, N. J. July 12–16, 1937.

American Heart Association. Atlantic City, N. J. June 7–8.

American Home Economics Association —30th Annual Meeting. Muehlebach Hotel, Kansas City, Mo. June 21–25.

American Hospital Association. Atlantic City, N. J. September 13–17.

American Medical Association—Eighty-eighth Annual Session. Atlantic City, N. J. June 7–11.

American Public Health Association —Sixty-sixth Annual Meeting. New York, N. Y. October 5–8.

American Radium Society. Atlantic City, N. J. June 7–8.

American Society of Clinical Pathologists. Philadelphia, Pa. June 2–6.

American Society of Heating and Ventilating Engineers—Semi-Annual Meeting, 1937. New Ocean House, Swampscott, Mass. June 24–26.

American Society of Medical Technologists. Atlantic City, N. J. June 7–9.

American Therapeutic Society. Atlantic City, N. J. June 4–5.

Canadian Public Health Association. Chateau Laurier, Ottawa, Ont. June 17–19.

Canadian Tuberculosis Association. Chateau Laurier, Ottawa, Ont. June 17–19.

Fifth International Congress of Radiology. Chicago, Ill. Sept. 13–17.

Health Officers and Public Health Nurses Annual Conference, under the auspices of the New York State Department of Health. Grand Union Hotel, Saratoga Springs, N. Y. June 22–24.

International Association of Milk Dealers. Dallas, Tex. Oct. 21–23.

Medical Society of New Jersey. Atlantic City, N. J. June 1–5.

Medical Women's National Association. Atlantic City, N. J. June 6–8.

National Association of Insecticide and Disinfectant Manufacturers, Inc. Chicago, Ill. June, 1937.

National Education Association. Detroit, Mich. June 28–30.

National Tuberculosis Association—Milwaukee, Wis. May 31–June 3.

National Tuberculosis Association—Los Angeles Institute for the Training of Tuberculosis Workers. Los Angeles, Calif. June 15–30.

New England Health Education Association. Annual Meeting. Massachusetts Institute of Technology, Cambridge, Mass. June 4–5.

Ontario Health Officers' Association. Chateau Laurier, Ottawa, Ont. June 17–19.

Pennsylvania Sewage Works Association—11th Annual Conference. State College, Pa. June 21–23.

Vancouver Medical Association Summer School. Vancouver, B. C. June 22–25.

FOREIGN

First International Neo-Hippocratic Congress. Paris. July 1–4.

National Association for the Prevention of Tuberculosis. Bristol, England. July 1–3.

International Congress of Vacation Colonies and Fresh-Air Camps. Paris. July 1–4.

International Pharmaceutical Congress. Paris. July 4–7.

Fifth International Congress of Hospitals. Paris, France. July 5–11.

International Hospital Association. Under auspices of Federation of Hospital Unions of France. Paris. July 5–11.

International Congress of Medicine Applied to Physical Education. Paris. July 11–17.

International Congress of Public Health Work. Paris. July 12–16.

International Public Health Days. Paris. July 1–11.

Health Congress of The Royal Sanitary Institute. Birmingham, England. July 12–17.

Second International Congress of Sanatoria and Private Nursing Homes. Paris. July 12–17.

Fourth International Congress of Compared Psychotherapy and Psychology. Paris. July 16–18.

Second International Congress of Mental Hygiene. Paris. July 19–23.

British Medical Association. Belfast, Ireland. July 20–25.

Congress of Infant Psychiatry. Paris. July 25–28.

British Dental Association. Cambridge, England. July 30–August 3.

Seventh Biennial Conference, Health Section of the World Federation of Education Associations. Tokyo, Japan. August 2–7.

World Congress of Universal Documentation. Paris. August 16–21.

Fourth International Pediatric Congress. Rome, Italy. September 24–30.

Second International Congress for the Protection of Infancy. Rome, Italy. October 4–8.

Congress of Physiologists. Paris. October 11–13.

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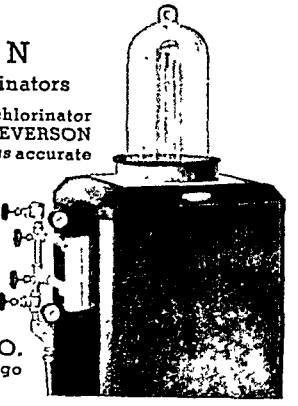
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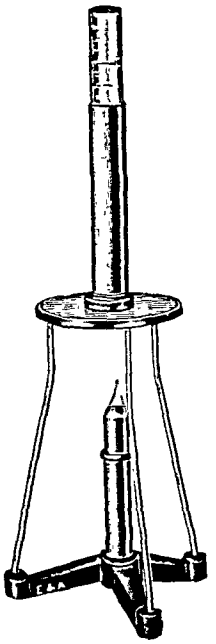
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Young man, S.B. in biology and public health; Massachusetts Institute of Technology, post-graduate course in health education, business administration and economics; desires executive position with official or non-official agency. Has been health officer of a city of 10,000 population for 9 years. A-296

Physician, M.D. Ohio State University, C.P.H. Harvard School of Public Health, seeks position as health officer or epidemiologist. A-297

Physician, M.D. Indiana University; C.P.H. Johns Hopkins University; special courses in epidemiology, biostatics and public health administration; several years' experience as physician to city health department; desires position as full time county health officer. A-269

M.D. desires position as health officer. Has been city and school physician for 4 years. A-280

Physician, M.D. Syracuse University, post-graduate studies in bacteriology and immunology, will consider position as health officer or epidemiologist. Has served as director of a county health unit, CCC camp and district surgeon, medical and sanitary advisor in public health and epidemiologic problems and venereal disease field survey officer. A-305

STATISTICIAN

Young man with 8 years' experience public health statistics in well known national organization and degree in Business Administration, now employed, will consider statistical position or combination with office administration. S-310

LABORATORY

Young man, A.B. in Chemistry, Phillips University; M.S. in Public Health Laboratory Work, University of Michigan, June 1937; desires position in state or city health department laboratory. L-304

Man with M.S. Major in Bacteriology and Biochemistry, desires position with university health department or hospital as bacteriologist. Five years' experience as research assistant and instructor in bacteriology and serology in a Class A medical school. L-306

CHILD HYGIENE

Pediatrician, graduate Columbia College of Physicians and Surgeons 1912, with excellent background of practical and administrative experience in large city health department, will consider position of teaching or administration in child hygiene. A-288

Young woman, M.D. Yale 1930, Dr.P.H. Yale, excellent background teaching and child hygiene administration, state and local, will consider an exceptional opportunity, preferably in the East. C-289

Physician, M.D. University of Iowa, with experience as state director of child hygiene and with a background of health education, has been full-time city health officer and teacher in Class A medical school, is available for position paying $5,000 per annum. A-290

Woman physician, M.D. Creighton Medical School, with extensive experience in maternal, infant and child hygiene and special interest in crippled children's service, desires position in field work. C-301

MISCELLANEOUS

Physician, M.D. Western Reserve University; M.P.H. Harvard; extensive experience in pediatrics and school medical service; also background of county health administration and teaching in Class A medical school; now employed; will consider expanded opportunity in teaching or research. M-302

Young woman, M.S.P.H. University of Michigan, experienced in laboratory research and health education, is available for research or investigative work. M-303

Experienced research microbiologist, Ph.D. Western Reserve University, will consider position in public health laboratory service or university teaching. M-291

Physician, M.D. Northwestern University; Ph.D. Johns Hopkins University; Dr.P.H. Yale University; is eager to secure general public health work, health center administration, infant welfare or epidemiology position. A-300

Young physician, M.D. University of Michigan, wishes position as epidemiologist, preferably in field and clinical work in syphilis control. M-307

Woman, Ph.D. with broad experience and excellent background, desires position doing socio-medical research. M-308

Physician with post-graduate studies in public health at University of Michigan, seeks employment in public health field. Has served as Acting Assistant Surgeon, U.S.P.H.S., part-time county health officer and assistant director of a state health department division of maternal and child health. M-309

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VITAMIN REQUIREMENTS OF MAN

IV. VITAMIN B_1

● The multiple nature of vitamin B has been definitely established by intensive research within the past decade. Considerable quantitative information is now available concerning the requirements of certain species of animals for the various factors contained in the vitamin B complex. At the present time, however, the anti-neuritic vitamin B_1 is the only one of these factors for which the minimum requirement for man can be postulated.

Beriberi-preventing diets of Chinese coolies and natives of Java have been estimated to contain 200 International units of vitamin B_1 (1). Practical use is made of knowledge such as this in the Philippines, where the Bureau of Science, in a successful effort to combat beriberi, dispenses tikitiki (vitamin B_1 concentrate from rice polishings) containing approximately 200 International units of vitamin B_1 per daily dose.

It is generally agreed that the absolute requirement for this factor may be variable, depending upon such factors as size and caloric intake of the individual. However, equations have been derived which take into consideration some of these variables and are useful in estimating the adult vitamin B_1 requirement (2).

Application of these equations indicate that approximately 225 International units of vitamin B_1 per day are required for the average American adult. The average daily infant requirement has been estimated to be 50 International units, increasing to 200 units at the time of adolescence (1). The League of Nations Technical Commission recommends a daily intake of over 150 International units for pregnant and lactating women (3).

While it may be possible to estimate the daily intake of vitamin B_1 which will prevent clinical beriberi, it is not yet possible to state the minimum amount of the vitamin which, when imposed on an otherwise adequate diet, will promote optimum nutrition. There is increasing belief that some of the vague disorders, noted clinically, may be in reality manifestations of suboptimal vitamin B_1 intake (4).

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(1) 1934-35. Am. Pub. Health Assn. Year Book. Page 70
(2) The Vitamin B Requirements of Man. G. R. Cowgill Yale University Press. New Haven. 1935
(3) 1936. Nutr. Abst. and Rev. 5, 855
(4) a. 1936. J. Am. Med. Assn. 106, 261
b. 1935. Ibid. 105, 1580
(5) a. 1932. Ind. Eng. Chem. 24, 457
b. 1932. J. Nutrition 5, 307
c. 1934. Ibid. 8, 449
d. 1935. Ibid. 11, 383
(6) 1934. U.S. Pub. Health Rpts. 49, 754

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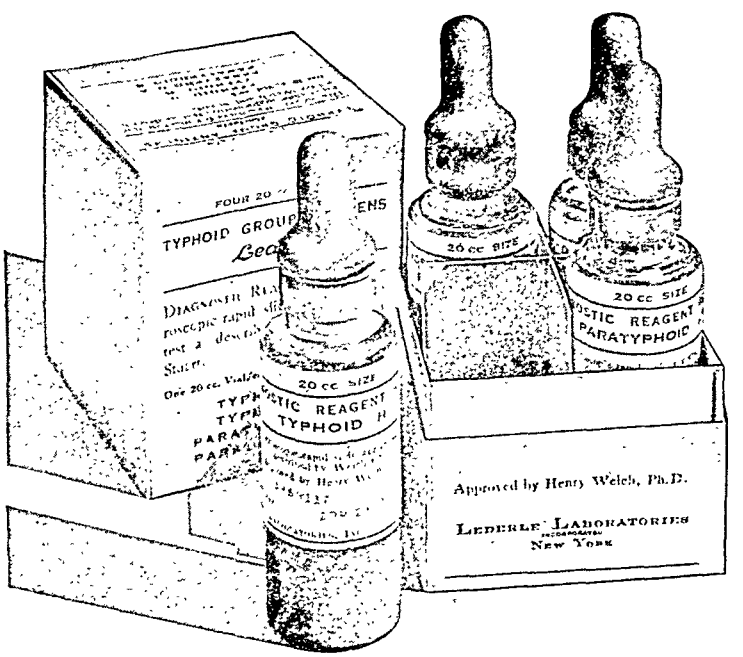
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American Journal of Public Health
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Official Monthly Publication of the American Public Health Association

Volume 27 — July, 1937 — Number 7

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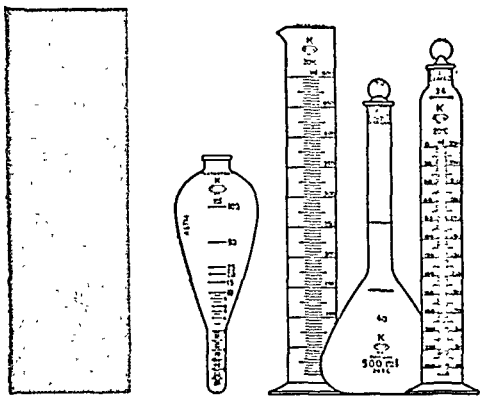
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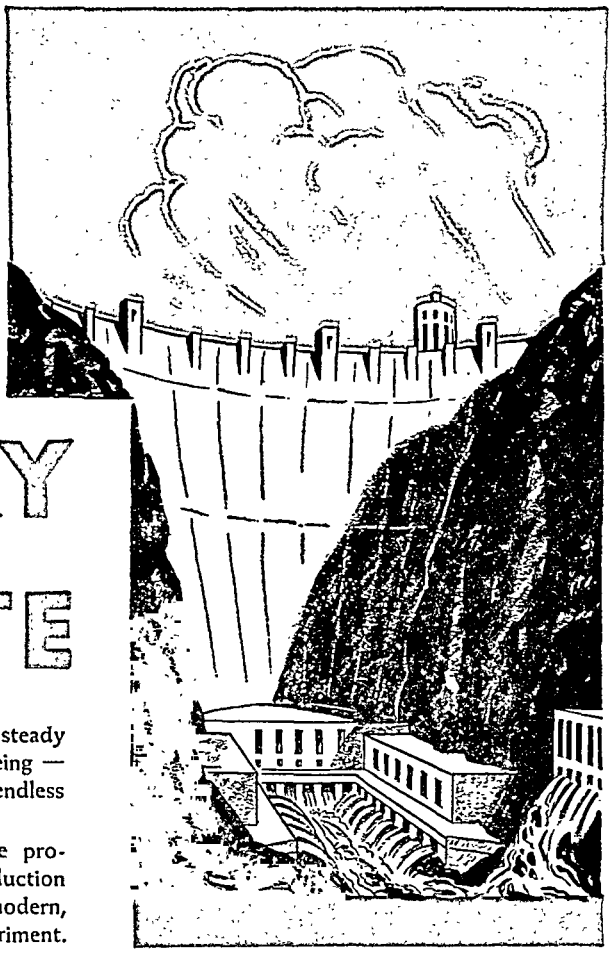
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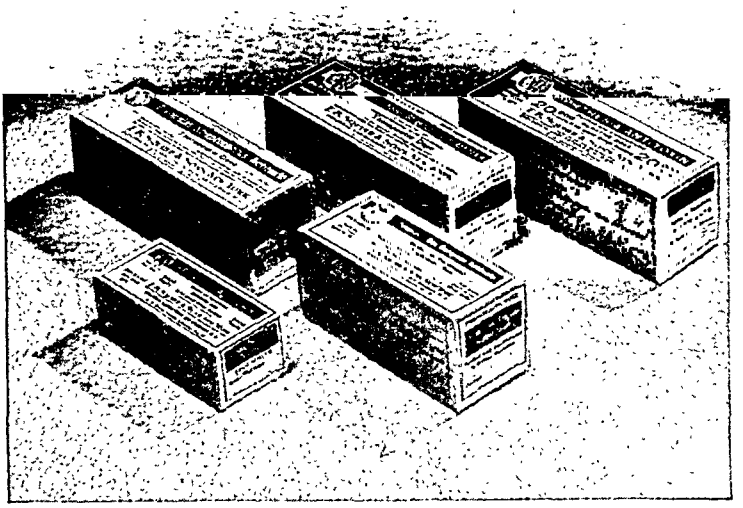
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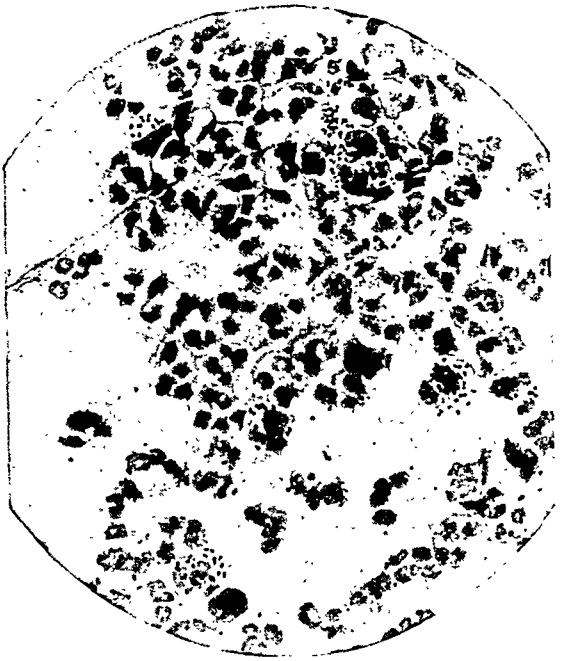
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GEORGIA PUBLIC HEALTH ASSOCIATION M. E. Winchester, M.D., Commissioner of Health, Brunswick.	To be announced
MASSACHUSETTS PUBLIC HEALTH ASSOCIATION G. Donald Buckner, 43 Coolidge Avenue, Needham.	To be announced
MICHIGAN PUBLIC HEALTH ASSOCIATION Marjorie Delavan, State Department of Health, Lansing.	Lansing, Nov. 10–12
MISSOURI PUBLIC HEALTH ASSOCIATION John W. Williams, M.D., County Health Officer, Springfield.	To be announced
NEW MEXICO PUBLIC HEALTH ASSOCIATION Paul S. Fox, Box 711, Santa Fe.	To be announced
NORTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION I. O. Church, M.D., Alameda County Hospital, Oakland.	To be announced
OHIO FEDERATION OF PUBLIC HEALTH OFFICIALS W. D. Bishop, M.D., Darke County Health Unit, Greenville.	Columbus, November
PENNSYLVANIA PUBLIC HEALTH ASSOCIATION J. M. J. Raunick, M.D., Health Officer, Harrisburg.	To be announced
PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY Frank Kiernan, 386 Fourth Avenue, New York.	To be announced
SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION Laura Blackburn, State Board of Health, Columbia.	To be announced
SOUTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION R. L. Kaufman, M.D., 402 So. Greenleaf St., Whittier.	To be announced
TEXAS PUBLIC HEALTH ASSOCIATION P. A. Kerby, State Department of Health, Austin.	El Paso, October
VIRGINIA PUBLIC HEALTH ASSOCIATION B. B. Bagby, M.D., Pres., 1302 Avondale Avenue, Richmond.	To be announced
WEST VIRGINIA PUBLIC HEALTH ASSOCIATION Dr. Edwin Cameron, Wetzel County Health Dept., Martinsville.	October
SOUTHERN BRANCH, A.P.H.A. G. Foard McGinnes, M.D., State Department of Health, Richmond.	To be announced
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Studies with Activated Carbon in Sewage Sludge Digestion.

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Progress of Sewage Treatment in New York City.

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Design of the Sewage Treatment Works of the Sanitary District of Chicago.

Improvements in Sewage Treatment at Stockton, California, as Affected by Cannery Wastes.

Coagulation Contrasted with Chemical Precipitation in Sludge Filtration.

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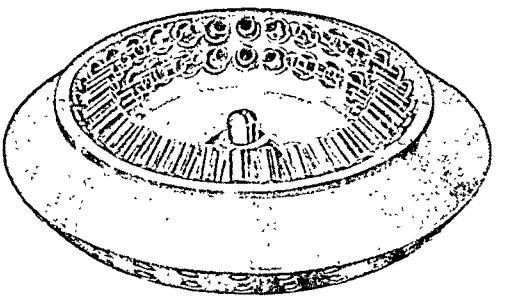
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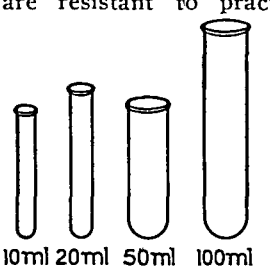


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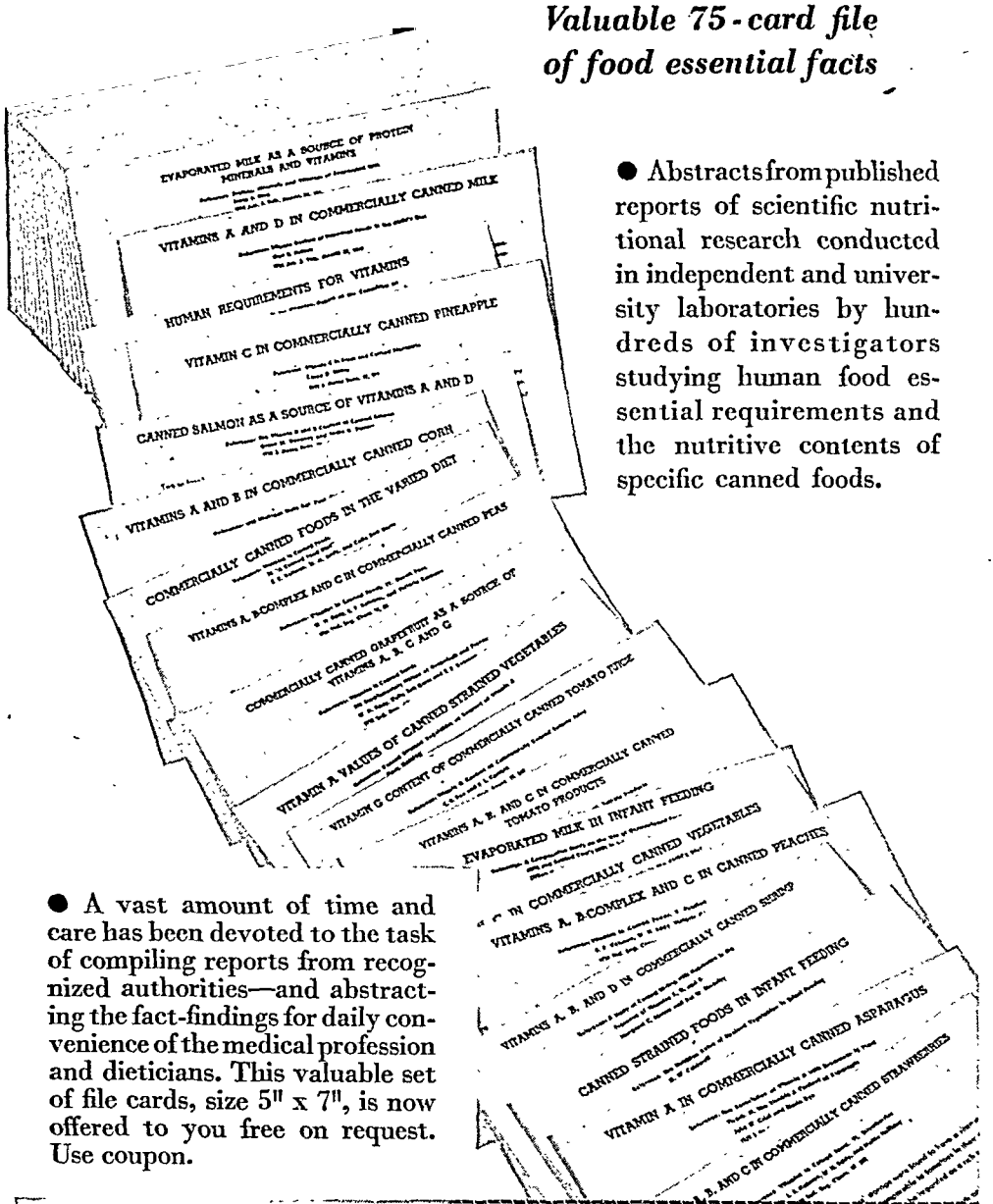
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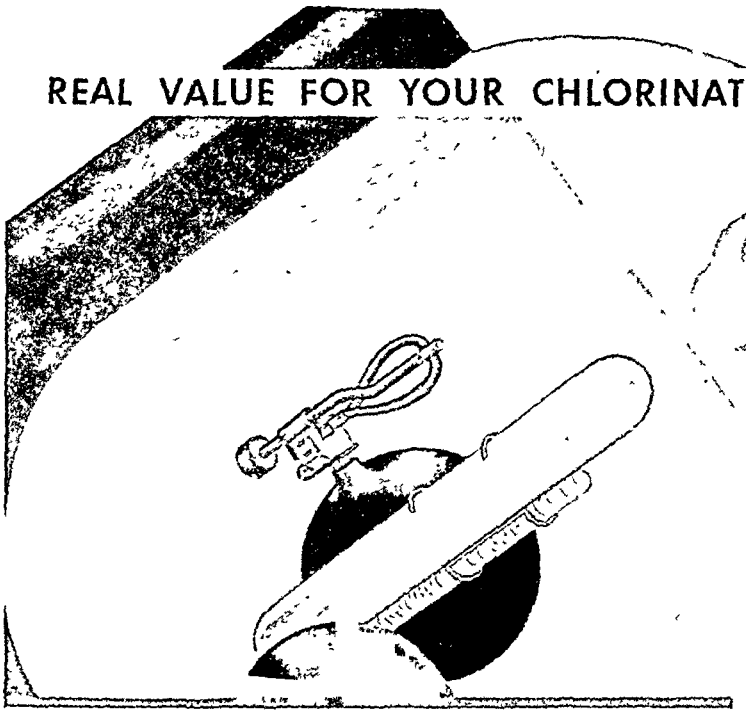
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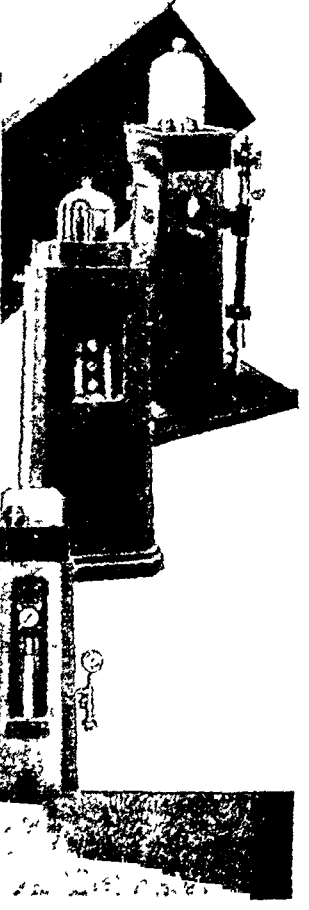
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and THE NATION'S HEALTH

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Developing a Housing Program in a Southern City*

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UNTIL recent years, the housing activities of the Department of Health of the City of Memphis, outside of the efforts made to get houses connected to recently extended public sewer and water lines, consisted largely of efforts to keep down complaints of citizens by concentrating inspection service in areas where complaints were coming from and on items complained of. Work was being done at the direction of the complaining public and not according to a plan or program designed to meet a public health problem. No permanent accessible records were kept and this prevented any analysis or study of definite data to aid in the formulation of an intelligent housing program.

Beginning in 1929, and continuing to the present date, permanent records have been kept of housing conditions found at all homes or premises inspected. These are filed by wards and by address, and where special problems involving complaints, letters or records of special investigations are accumulated on one house, an envelope is used to keep the records together and in the same housing file.

At first an intensive drive over several years was made to enforce compliance with existing housing ordinances and a great deal of new construction and repair work was accomplished, especially in the way of securing at least 1 toilet to each 2 families, water and sink within 25 feet of each house; screening and mosquito proofing, and, the demolition of dilapidated houses. It was noticed that such supposed improvements were doubtful gains and at the most might be considered temporary expedients. In fact, it appears now that the more outdoor communal toilets are installed, the more insanitary toilets there are to supervise. Communal conveniences are neglected, abused, and in many instances stolen or destroyed bit by bit, resulting in insanitary conditions and a return to the original condition within a year or two.

It has been increasingly evident to all of those concerned with this problem in Memphis that our ordinances

* Read before the Health Officers Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

are out of date, and were drawn before the transmission of some diseases was understood.

We believe that good housing is an essential foundation on which to build a well rounded health program and, as the late Edgar Sydenstricker said,[1] although the

> . . precise relationship of housing to health is not fully known there is no question that certain types of housing are conducive to the spread of infectious diseases and tend to break down the resistance of inmates to other diseases Slum clearance in our cities and better housing for persons of low incomes wherever they may live, are clearly preventive measures which are in the category of public health functions.

In the larger cities where so much needs to be done, the health department may not actually be concerned with the administration of a housing program, although it will certainly be called on to investigate complaints in regard to poor housing conditions and will be in a position to make its influence felt in trying to work out a solution. In many cities the health department may be the logical agency to take the prime interest in, and to define to a large extent the housing problem and undertake its solution.

As expressed by J. Scott MacNutt[2]:

> Little has been done by health officials in this country to approach the housing problem in its deeper conditions. The reason for this is clear. Public health is only one aspect of a large problem which must be attacked coöperatively from several directions. Safety, economy, and morality make it a sociological problem as well as a merely sanitary one. The factor of personal hygiene is so great that education must play a large part. Nevertheless, housing will always remain one of the prime influences on health, to which every health department should pay as much attention as is consistent with its other duties. There is perhaps no other field in which preventive measures should look so far ahead and should so anticipate the evils of growing communities. Such evils are far more easily prevented than cured.

The larger southern cities, although having had safe public water supplies for years have higher typhoid rates than found in any other section of the country. In smaller cities in the South with populations of less than 100,000 it is not uncommon to have rates of from 10 to 25 deaths per 100,000 from typhoid fever.

In a previous paper,[3] based on a survey made in 1934, in Memphis, "Typhoid fever rates for the colored showed a direct relation to specific slum areas grouped according to percentage of living units without private toilets." Has the outdoor communal toilet, whether a pit or open privy as in some towns or cities, or an outdoor communal toilet connected to a sewer system as in Memphis, kept typhoid fever and other intestinal disease rates from coming down as rapidly as would be expected from results elsewhere after the providing of safe public water supplies?

Also, "Typhoid fever rates for the whites living in specific slum areas showed a direct relation when grouped according to typhoid fever rates for the colored race in those areas." This emphasizes one of the reasons advanced by many for improving housing conditions of slum dwellers for the protection of those who live nearby or who come into contact with them as servants at work, or in the home.

The filth-borne diseases as well as the insect-borne group invite serious thought and study by public health workers in the South to the problem of housing the low wage earner.

Other very pertinent facts were brought out in the same survey.

DILAPIDATED DWELLINGS

Eight and six-tenths per cent of all of the dwellings in the city were dilapidated to the point that it was impractical to attempt patching to meet minimum standards of decent and sanitary

dwellings. Fourteen per cent of the dwellings occupied by colored people were dilapidated, against 2 per cent of those occupied by white people. In one ward in the center of the slum district, 63 per cent of the dwellings occupied by colored were in a dilapidated condition. In another ward occupied by a high percentage of white people, 26 per cent of the houses in which they live were dilapidated. These figures indicate the run-down, neglected condition of the large areas of dwellings occupied by the low wage earner, particularly among the colored.

POVERTY

Of the white people 21 per cent pay less than $3 per week rent, while among the colored 94 per cent pay less than $3 per week. This rental includes the entire dwelling unit regardless of whether they live in 1, 2, 3, or more rooms. Seventy-three per cent pay less than $9 per month rent for the entire dwelling unit. This emphasizes the contribution that poverty makes to the development of a slum. See Chart I for the classification of the renting colored population of Memphis into 4 rental groups. No attempt will be made to show the exact dividing line between indigents and the group that could be reached with subsidized housing or between the group that could be provided for by private capital (if a housing code were enforced for this group) and those who pay sufficient rent to select houses meeting minimum standards. It does indicate that there are 4 groups requiring different treatment and different problems for solution.

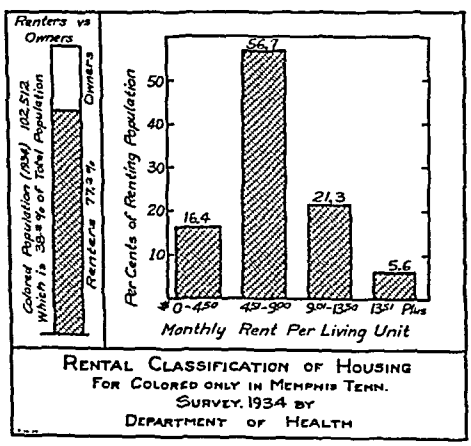


CHART I

INSANITATION

In addition to being dilapidated or in need of major repairs, approximately 70 per cent of the colored dwellings are supplied with the communal toilet or pit privy in the yard, and only 20 per cent have the toilets within living units. Eighty-six per cent of the white population have toilets within the living unit and an additional 3 per cent have the toilet on the back porch, but private to that family: leaving 11 per cent of the white people using communal toilets and pit privies in the yard.

WATER SUPPLY

Sixty-three per cent of the colored used communal hydrants in the yard or on the porch for their water supply, while for the white people, only 4.5 per cent used a communal hydrant in the yard for their supply.

REAR AND ALLEY DWELLINGS

Twenty-one per cent of all the dwellings occupied by colored people were rear or alley dwellings. In 4 wards all of the houses occupied by colored people were in the rear. Ninety-nine per cent of the dwellings, however, occupied by white people face a street.

POPULATION DENSITY

Memphis does not have a high density of population. The average number of persons per acre for the city is 8.6 and the most densely populated ward shows a population of 31 persons per acre. It is understood that in some

of the larger cities, the population per acre will run over 125.

OWNERSHIP

Sixty-seven and one-half per cent of the people of Memphis live in rented homes or units; 77.2 of the colored and 58.7 of the whites.

It is known that a large per cent of the occupant owned homes among the colored in Memphis are of the same type as the rented homes or units.

Many elements, as illustrated in these figures enter into the housing problem. Municipal neglect as indicated by the lack of housing codes is an important factor while poverty and ignorance on the part of the slum dwellers and ignorance and greed of some property owners have contributed to these housing evils mentioned above.

The program of housing for Memphis is developing slowly, but soundly along several lines at this time:

1. The drafting and early adoption of a housing code to prevent the formation or building of new slums by controlling future building and alteration of dwellings.
2. By correcting existing conditions through condemnations and orders for improvements and for proper maintenance in order to bring existing conditions up to a minimum standard. This will be developed systematically with specific areas selected for specific treatment.
3. Through continued study and analysis of existing conditions in the slum areas with a view toward continued planning of an intelligent housing program that will yield the greatest returns on the efforts expended.
4. Serious study of the cost of a minimum standard house or units of housing if built on a large scale in order to determine what steps may be taken for government housing for those families that private capital is not or should not be interested in because of their low earning power and rental limits.

A code for Memphis is now being prepared, in the preparation of which no assistance was available from any of the federal divisions, such as: the P.W.A., the Bureau of Standards of the Department of Commerce, and the Public Health Service. *The Model Housing Code*,[4] by Lawrence Veiller was pointed out by the Bureau of Standards as recommended for use by municipalities of the State of New York, and it seems to be the foundation of most of the housing codes of the country. It has served as the basis for the Memphis Housing Code, which is now undergoing a refining process of comparison with the Building Code, the Zoning Ordinance and the Fire Prevention Ordinance. It is hoped that a comprehensive housing code will be adopted early in 1937 for the City of Memphis. After the adoption of a practical and fundamentally sound housing code, its enforcement is expected to raise a number of difficult administrative problems.

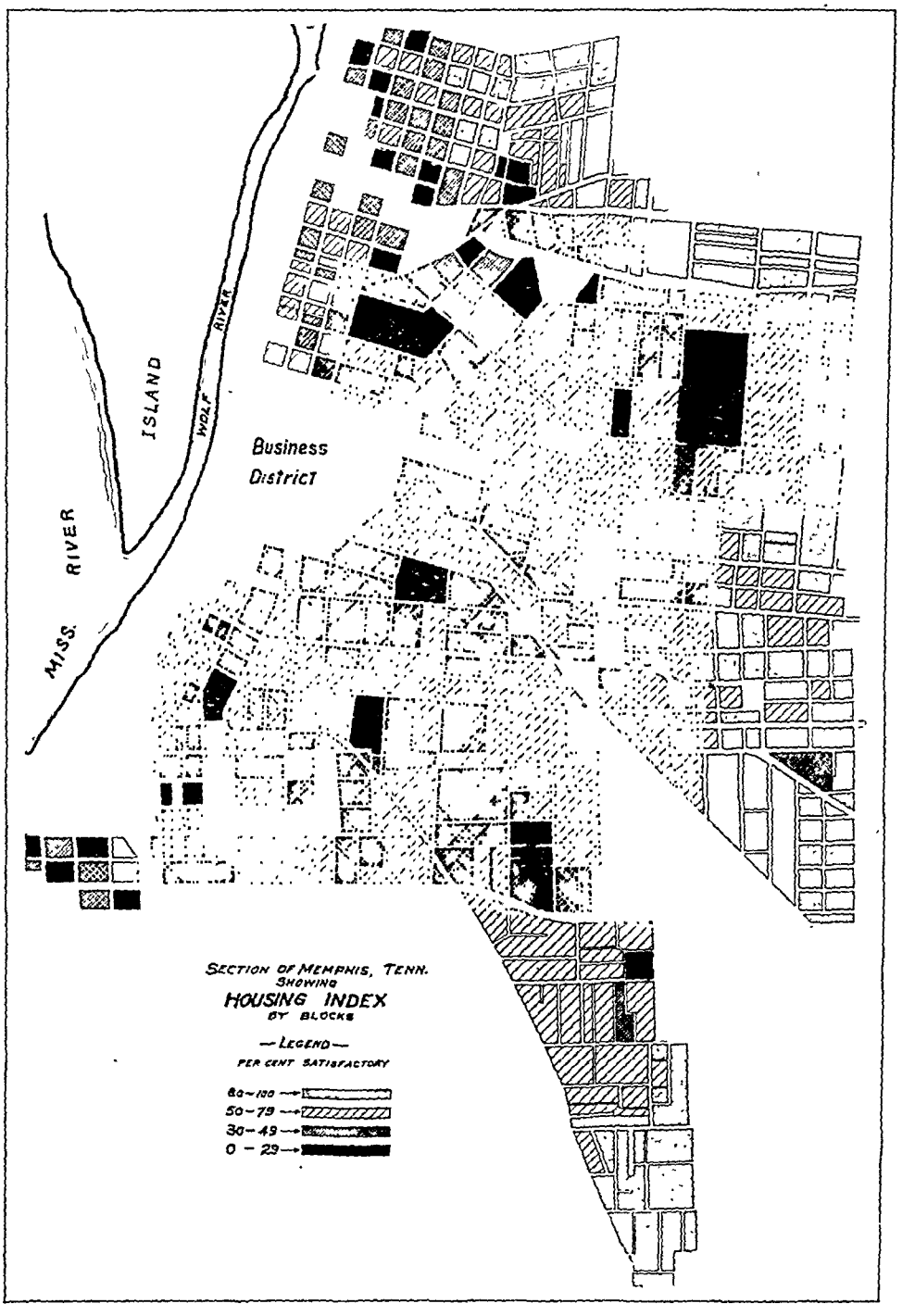
The second of these measures, subsidized housing by the federal government, has already been initiated in Memphis. Two federal housing projects for 1,183 families are already under construction. While the first housing survey was in progress, the Federal Housing Division of the P.W.A. announced that they would accept applications for slum clearance and rebuilding projects with the division putting up 100 per cent of the cost of the project, but the filing of such an application at that time required the securing of more detailed data on specific slum areas to be torn down. An application for a second housing survey was made which was finally approved in an abbreviated form, and the survey was made under the direction of a Housing Commission appointed by the Mayor of Memphis. A systematic accumulation of data was made including a field survey, many photographs, the summarizing of records of deaths, accidents, sickness, crime, juvenile delinquency, traffic accidents, back taxes, supported by expressions of backing from the Civic and Luncheon Clubs, Chamber of Commerce, and



PICTURE 1—Houses for which tenants pay $1.75 a week for the entire living unit

prominent business organizations, individuals, etc. Two most excellent and complete applications were made to the Housing Division of the P.W.A. They received approval and are now under construction. The story of the federal slum clearance projects and the efforts made to make it a reality will not be discussed in this brief outline of the activities of the Housing Division of the Health Department.

According to the housing survey, it appears now that approximately 60 per cent of the renting population of Memphis cannot live in dwellings meeting the federal minimum standards. This statement is based on the fact that 60 per cent of the population pay less than $13.50 a month rent for the entire living unit, which is considerably less than rents being charged by federal housing projects completed elsewhere. A certain per cent of these are able to secure, for this rent, satisfactory houses when judged by the local Health Department minimum housing standards. A large per cent of the colored occupant owned houses are far below the minimum standard of housing and the monthly payments on them are less than $13 a month. It is admitted by many that private capital could organize limited dividend housing corporations, or the equivalent, by pooling the resources of a group of property owners in a completely dilapidated slum area, and furnish sanitary minimum standard housing for a lower income group than is provided for by the federal projects in Memphis. Land in the slum areas is worth very little, being undesirable property for business or industrial development, and because the value of the property depends on the type of housing


ISLAND
WOLF RIVER
MISS. RIVER
Business
District
SECTION OF MEMPHIS, TENN.
SHOWING
HOUSING INDEX
BY BLOCKS
—LEGEND—
PER CENT SATISFACTORY
80–100
50–79
30–49
0 – 29

MAP I

around it. In addition, in some cases second hand material could be used, and certain standards adopted by the Federal P.W.A. Housing Division. such as the central heating plant, all fireproof material, expensive foundations, etc., might be left out, as well as other savings possibly by private capital which totalled together, may more than offset the subsidy of the government.

Many dwellings can be properly maintained through remodeling and modernizing of plumbing, etc., in order to meet minimum housing standards, and charge less rent than would have to be charged by the federal slum clearance projects. The federal slum clearance projects in Memphis will serve as a stimulus and a demonstration which has already helped to arouse a general interest and support of the housing program in Memphis. Two dilapidated insanitary slum areas have been completely razed to make way for the 2 federal low-cost housing projects.

The natural pick-up in employment and the amount of steady work on the part of the low wage earners which seems to be increasing, will undoubtedly increase the percentage of people who will be able to take advantage of the subsidized federal housing dwellings.

To analyze further the make-up of a slum area, an interesting and original analysis of the slum area of Memphis is being carried on which should be very helpful in working out the administrative procedures for the enforcement of the Housing Code. Briefly, it is an attempt to place a numerical value or rating on each house, based on the per cent of perfection of the house to an arbitrarily set-up minimum standard house. The record of each house is being tabulated on a special form in the field.

Several of the key facts on the inspection cards as turned in to the office for filing are selected for judging the potential unhealthfulness of the dwelling surveyed. The points used are: location, condition and use of toilets; location, condition and use of water and sinks, screens, roof, floors, walls, ceiling and chimney; the number of families provided for by the dwelling, and the number of persons per room. These specific points are selected for a study of Memphis housing conditions because the problem is not so much the density of population on the land in the sense that there are too many people per acre, although there are a few such cases, but that there is a high percentage of people living in back areas, facing alleys and not adequately supplied with the fundamental sanitary appliances or facilities, as well as poorly designed and constructed dwellings which have a tendency to deteriorate quickly and permanently.

The points outlined when assigned more or less arbitrary numerical values with deductions for unsatisfactory condition of the various items, give a picture of the degree of bad housing in comparison with an ideal minimum standard house as assumed for Memphis. The resulting figure for a dwelling is called the sanitary rating or factor. By combining dwellings into blocks of dwellings, a picture of the degree of the problem as it varies from block to block, or area to area is obtained.

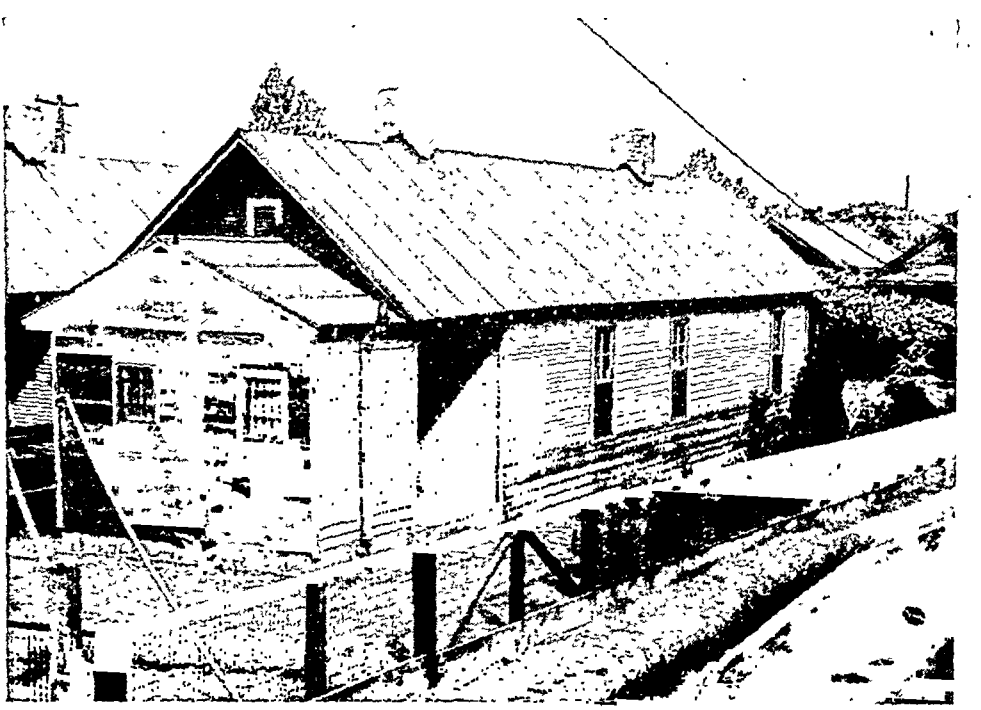
Another factor that deserves consideration when a group of dwellings is considered is the play space or yard, and the location and view from the dwellings because of this influence on insanitary methods of sewage and garbage disposal and general cleanliness, as well as moral influence on the children as shown by juvenile crime, etc. Again, in Memphis a rough figure on this can be secured by using what is called a rear dwelling factor, that is, the per cent of people living on or facing a street in the block. The larger

the per cent of rear and alley dwellers, the lower the rear dwelling factor for any specific area. To arrive at a housing index then, a weight of 3 is assigned the sanitary factor and a weight of 1 is assigned the rear dwelling factor, and the sum of the two is divided by 4. The quotient is the housing index.

By shading on a map of the city the lowest index blocks and then the blocks next best and so on, it has been possible to put on paper, for study, a picture of slum housing conditions so that the cores of bad areas stand out, and radiating from these cores are the slums in varying degrees of dilapidation and insanitation. The areas being blighted by the slum stand out as barriers between the better residential areas and slum areas. As these specific areas are identified and stand out as rotten cores in our slum area, it may be possible to interest groups of property owners in those areas to pool their resources and develop limited dividend housing projects or their equivalent for clearing the area and rebuilding minimum standard dwellings. It is a hopeless task for any one property owner to try to improve his property if it is in the center of a completely dilapidated and insanitary slum area, unless the surrounding property is also improved. (Map I shows the results of this analysis to date.)

Picture 1 illustrates roughly the type of housing that rates less than 30 per cent by this method. These tenants pay $1.75 per week rent for the entire living unit. Picture 2 illustrates an 80 to 100 per cent dwelling renting for $3 a week. This house has inside private toilet and water faucet and sink connected to city sewer and water lines.

The study which is being made of our daily records will assist in presenting a clearer picture of the problem, so that



PICTURE 2—Type of dwelling renting for $3 a week

TABLE I

Slum Data on Rentals, Vacancies and Crowding, Showing Relationship Grouped According to Degree of Bad Housing

Housing Index See Map I for Legend	Total Units Occupied	Total Population	Per Cent Vacant	Average Weekly Rent per Unit	Average Rooms per Unit	Average Weekly Rent per Room	Average Persons per Room
Blocks averaging per cents of a minimum standard: 0 to 29.9	1,217	4,002	6.95	$1.78	2.87	$0.618	1.15
30 to 49.9	5,136	17,554	6.97	2.29	3.16	0.726	1.08
50 to 64.9	4,022	14,971	5.19	2.75	3.74	0.736	0.99
65 to 79.9	2,627	10,269	4.58	3.35	4.03	0.831	0.97
80 to 100	2,092	8,324	3.73	5.71	4.88	1.167	0.81
Total	15,094	55,120	5.65	$3.03	3.68	0.823	0.99

a practical general housing program from an administrative standpoint can be developed and any progress made can be shown.

It is interesting to note that this same study, made in 1936, shows a direct relationship between the degree of slumness and such items, as, high vacancies, low rents, few rooms per dwelling, more persons per room, etc., as shown by Table I.

The law of supply and demand is plainly indicated. As the rents decrease the housing gets worse, the vacancies increase, crowding increases and rooms per unit decrease. It would seem to point the way to where to apply enforcement proceedings in order to get the greatest returns for effort expended. Private capital getting reasonable rents and not furnishing a minimum standard house should be forced and should welcome this enforcement on all owners without exception, to meet the standard in order to bring all houses in the blighted areas up to a decent standard. However, any effort to enforce minimum standards in the very low rental slum areas where the existing conditions are very bad can result only in slum clearance. This effort is worth while only where there is a sufficient per cent of vacancies, and should be directed toward the elimination of the worst dwellings.

The field of housing and its influence on the public health and welfare of the low wage earner is a most interesting and fascinating problem and promises to attract more and more of the time and study of public health workers. The problem is there whether it is recognized or not. Other groups are promoting a very definite interest and demand for improvements.

SUMMARY

1. Until recent years the housing activities of the Department of Health were carried on largely at the direction of the complaining public and not according to a plan or program designed to meet a public health problem.

2. A housing study was made in 1934 and certain data developed which helped to define the problem in Memphis.

3. A suggested fundamental program for control has been outlined.

4 A housing code is being drawn for early adoption.

5. An analysis of the slum areas is being made. An arbitrary numerical value is assigned to each dwelling.

6 By shading a map of the city on the lowest index blocks and then the blocks next best and so on, it has been possible to put on paper, for study, a picture of slum housing conditions so that the cores of bad areas stand out, and radiating from these cores are the slums in varying degrees of dilapidation and insanitation.

7 Improvements in existing housing furnished by private investment can be obtained only in blighted areas where reasonable rents are collected to justify improvements.

8. Enforcement in the poorest slum areas will result in slum clearance and can be carried only as far as vacancies will permit.

9. Subsidized government housing seems to be the only solution for the non-paying and fractional paying groups of the population.

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Control of Food Handlers

COMPLETE knowledge of the amount of illness caused by people who deal with food—"food-handlers" in the American sense—must obviously be lacking. Epidemics of scarlet fever, typhoid and paratyphoid fevers, and epidemic sore throat in recent years in England must have convinced people of the dangers of this source of infection, and a perusal of the rich store of facts compiled by J. C. G. Ledingham and J. A. Arkwright [1] vividly brings home the fact that the carrier is a danger to any food-handling trade. The Americans take these matters more seriously and logically, and the supervision of food-handlers is enforced by comprehensive regulations in the U. S. A. A recent report gives rise to the speculation that some greater measure of control in England might be advisable, although typhoid, for example, is not the common danger here that it is abroad—the result of the pioneer and progressive work on sewage and water supply which England gave to the world. Dr. J. R. Scott [2] of Albuquerque, New Mexico, records the results of 10 years' examination of specimens—presumably feces—from food-handlers. Among 6,600 specimens examined, 20 from 20 individual food-handlers gave cultures of typhoid bacilli, the positive carriers derived from various occupations being 3 per 1,000 among milk producers and among restaurant staffs, and 4 among 700 bakers. It may be that our English system of general supervision and intense "detective work" by efficient bacteriologists when an outbreak occurs is in the long run more effective and less costly than the American system; but is it? Such a system might be described as "delayed preventive medicine," and delay may entail loss of life. —Editorial, *Brit. M. J.* Apr. 24, 1937, pp. 871–872.

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Shrimp Inspection*

J. O. CLARKE
Food and Drug Administration, Chicago, Ill.

THE shrimp canning industry is located exclusively along the South Atlantic and Gulf Coasts, extending from North Carolina to Texas. Since the industry was established about 1880, the annual production has gradually increased until it is now more than 1,000,000 cases. Nearly 50 plants have been in active operation during the past year. The size of the plants varies greatly, some producing only a few hundred cases and others about 100,000 cases a year.

Shrimp is so perishable that decomposition sets in very soon after it is taken from the water unless proper precautions are observed to ice down the catch immediately. Since practically all of the shrimp supply is taken from waters where warm weather prevails, it is absolutely necessary to keep the raw material cool until it is canned. Unless careful preventive measures are observed spoilage may occur on the boats, in transit to the cannery, or during the course of preparation for canning. The greatest problem is the procurement of sound raw material that has been promptly iced. Also of paramount importance is prompt handling after receipt by the cannery. Some spoilage due to underprocessing or other faulty technic in canning has also been encountered.

The detection of decomposed shrimp in the raw state is comparatively simple, since it undergoes changes in appearance and odor that are fairly obvious. After the product has been canned, the appearance and odor are so changed that it is difficult to detect decomposition unless it is extreme. Inspectors of the Food and Drug Administration were aware of considerable spoilage in raw shrimp to be used for canning, but unless the spoilage had progressed to a very pronounced degree, it was impossible to detect decomposition in the canned article. Experiments were, therefore, performed to devise methods of detection.

Several packs of shrimp were prepared from raw material in all stages of decomposition and were examined from the standpoint of these chemical factors which had proved useful in the detection of decomposition in other products. No chemical determination was found to have diagnostic value. Certain odors, however, were detected in the packs which, while different from those of raw decomposed shrimp, were characteristic and definitely identifiable.

The Food and Drug Administration entered upon a program of regulatory activity, based on these methods of examination, which resulted in the seizure of enormous quantities of shrimp and the prosecution of offending shippers under the Food and Drugs Act. In 1934 approximately 25,000 cases of shrimp out of a 900,000 case produc-

* Read before the Food and Nutrition Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 20, 1936.

tion were seized. The seized goods had a value of nearly $100,000 and represented almost 3 per cent of the total output.

The record of seizures in 1934 speaks eloquently of the condition of the raw material before the passage of the seafood amendment. Reports of our inspectors reflected the generally insanitary condition of many of the canneries at that time. Sufficient ice was not available on the boats and large amounts of decomposed shrimp were delivered to the canneries. The holds of many boats where the shrimp was stored were not clean. No facilities, or at best inadequate facilities, were available at the canneries for washing shrimp as received. Inspection or sorting belts were not in general use and there was little careful scrutiny of raw material. Frequent delays in canning after receipt occurred, with consequent decomposition. There was little attempt at fly screening or other safeguards against insects. Floors were infrequently cleaned. Wooden table tops and other equipment that could not be maintained in a sanitary condition were generally used. Toilet facilities were inadequate and often there were no provisions for washing the hands of the operators. The buckets used by the pickers were not clean, and were returned containing the excess of meats over the weights for which the pickers were paid. These excess meats always accumulated in the bottom of the buckets and were returned time and again during the day with consequent spoilage. Water supplies were frequently polluted.

Processing was sometimes inadequate, and recording devices to check the operation were not generally used. There is little wonder that objective examination of shipments of canned shrimp frequently revealed decomposition. It should also be borne in mind that the examination did not permit detection of the filthy conditions frequently prevailing in the canneries.

Since the beginning of our regulatory operations there has developed a demand in the shrimp industry for a system of self-imposed inspection, financed by the industry if necessary, which would insure a product of unimpeachable quality. This would relieve the industry of the burden that heavy seizures had imposed. As a result of these demands, Congress in June, 1934, passed the "Seafood Amendment to the Federal Food and Drugs Act."

In its broader aspects the seafood amendment simply authorizes the Secretary of Agriculture to assign full-time inspectors to those plants that desire the service, and are willing to pay for it, to see that only shrimp that is entirely fit and legal in every respect is packed. Shrimp packed under inspection must be labeled "Production Supervised by U. S. Food and Drug Administration." The type of inspection provided is unique. It parallels to a degree the Meat Inspection Act in that it contemplates continuous inspection during the manufacturing process, but differs from that Act since the cost of inspection is assessed in part against the industry, and acceptance of inspection is entirely voluntary on the part of any manufacturer. So far as I know, there is no precedent for this type of food inspection.

Under the Food and Drugs Act, prior to the passage of the seafood amendment, federal regulation was limited to penalties in the form of seizures and prosecutions. With the difficulties involved in the procurement of suitable raw material and the keen competition among the canners, the industry as a whole was unable to respond to the pressure exerted through seizures to produce an unobjectionable product. An industry less highly competitive and

with a more practical control over the source of raw material might yield to the punitive measures provided by the normal enforcement of the Food and Drugs Act, but the conditions in the shrimp industry were such that drastic measures beyond those provided by the Food and Drugs Act had to be taken if the consumer was to be properly protected. Probably the plan of self-imposed government inspection is the most economical and efficient system to cope with conditions as they existed.

Let us now picture the plants operating under inspection contrasting the conditions with those before the inspection system was instituted. Before inspection is granted certain minimum conditions of equipment and facilities, based on the best possible sanitary practices, are required. Thorough screening must be provided to assure freedom from flies and other insects. Adequate washing devices to clean the raw material are required. Suitable inspection belts must be available. Picking and packing table tops, wash tanks, flumes, blanching tanks, brine tanks, and all utensils for handling the shrimp must be of metal other than lead, or of some other smooth, hard, non-porous material that can be readily cleaned. Adequate supplies of steam and clean unpolluted water must be provided. Adequate toilet facilities and wash basins with soap and paper towels are required. The plants must be equipped for code marking cans and with adequate instruments to record time and temperature.

After inspection is granted, the plant is not allowed to operate in the absence of the inspector, and the entire manufacturing process is constantly under his immediate supervision. Unfit shrimp is immediately condemned and slack sanitary practices are corrected at once. The shrimp is not admitted to the plant unless properly iced and free from spoilage. The decks and holds of boats and other conveyances are kept in a sanitary condition, thoroughly washed and disinfected with live steam or chlorine after each delivery. Raw material is handled expeditiously and under conditions to guard against spoilage or contamination. All equipment is kept clean and washed with unpolluted water and thoroughly steamed whenever necessary. Waste does not accumulate. All employees handling shrimp wash their hands after each absence from their post and observe all other habits of cleanliness.

The processing of the canned article is checked by personal observation and automatic temperature recording devices. As a final check-up the inspector is required to examine the canned product to determine its fitness.

In addition to demanding the production of unspoiled shrimp, the inspector keeps a constant check on weights, grade marks, and other types of misbranding. All labels used on inspected shrimp must be approved.

From time to time check-ups are made throughout the country to prevent the marketing of uninspected shrimp under any condition that would lead the consumer to believe it to be inspected shrimp.

The procurement and training of suitable personnel to operate the inspection system presents no small difficulty, but we have been successful in maintaining a force of able men of unquestioned integrity. The inspectors are all employed from civil service registers requiring at least a bachelor's degree with specialization in some science, usually chemistry. Before an inspector is appointed he is interviewed by a responsible officer of the Food and Drug Administration, and an estimate is made of his fitness. After appointment he serves a probationary period of 1 year. The initial salary is at the rate of

$2,000 a year, subject to furlough during the time that the shrimp plants are not in operation. The inspectors average about 8 months' employment per year. When the inspector reports for duty he is given intensive training for a period of approximately 2 weeks and assigned to a plant where he works under the supervision of an experienced man.

Approximately 95 per cent of the shrimp production will be under government inspection this year. A word of commendation is not out of order for an industry that accepts a plan such as is provided by the seafood inspection amendment, involving as it does the cost of installing the equipment demanded as a condition to granting inspection, which is entirely voluntary and the cost of which, until this year, was underwritten entirely by the industry. The system costs approximately $85,000 a year to operate and this year about half is being paid by the industry and half by the government.

When we picture the insanitary conditions in the canneries prior to the passage of the seafood amendment and compare them item by item with the conditions existing today, we must conclude that this operation has justified itself by the results obtained.

Rural Hygiene

"The European Conference in 1931 proposed that a new Conference on rural hygiene should be convened in 5 years' time to examine the results achieved and to adopt its recommendations to current problems and to the progress of public health technique.

"The Bureau of the Health Committee, in taking up the question of the preparation for this further Conference, expressed its opinion to the Council that, whereas at the 1931 Conference the various problems connected with rural life were approached more especially from the medical and health standpoints, subsequent enquiries had brought out more and more clearly the need for extending the scope to include more general considerations —that is, certain social and economic aspects of rural life.

"The health, social and economic aspects are, in fact, interdependent, and, if truly practical and not merely theoretical results are to be achieved, rural hygiene questions must be placed in their general setting—namely, that of rural life—while account must be taken of the factors of all kinds which come into play.

"It is indeed increasingly evident that to be successful in his efforts the hygienist cannot remain isolated in his field but must seek the collaboration, and endeavour intimately to coördinate his own work with that of all the various agencies concerned with the different aspects of a rural community's activities, the life of which represents one coherent whole."—Twenty-fifth Session of the Health Committee, League of Nations, May 4, 1937.

Practical Procedures in the Laboratory Diagnosis of Typhoid and Clinically Related Fevers*

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THIS paper is limited largely to the discussion of such procedures as have been found by the writer and his coworkers to be practical and best adapted to the laboratory diagnosis of typhoid and clinically related fevers.

While the incidence of typhoid fever as indicated by the mortality rate has steadily declined during the past decade, especially during the last 5 years, this disease is still a problem of major public health importance in Georgia, a state with a population of 3,000,000, 37 per cent of whom are Negroes. On a basis of 8.6 deaths per 100,000, assuming the usual case mortality of 10 per cent, 2,500 cases may have occurred in Georgia in 1935, although only 1,013 were reported. It is apparent, therefore, that there is abundant material for laboratory study.

The problem of accurate clinical diagnosis of typhoid fever in Georgia is complicated by the relatively high incidence of malaria and endemic typhus, both of which simulate typhoid, especially at onset; and often differentiation is dependent on laboratory aids. The extent to which the physicians are availing themselves of such assistance is evidenced by the fact that during the past 10 years (1926–1936) the writer and his coworkers have handled 30,902 specimens of blood, subjecting these to serological tests for typhoid, typhus, undulant fever, and tularemia, and to cultural study of the clot. At least 90 per cent of these specimens were collected by physicians and health officers throughout the state in Keidel tubes and shipped to the laboratories by mail. Tables I and II summarize the results obtained. While this service was partly in operation prior to the period covered by Tables I and II, it was not until 1929 that the present system was instituted. Beginning with 431 specimens in 1926, the number has steadily increased to 5,769 in 1935. Experience gained through trial and error and the steadily increasing load has brought about many changes in the details of technic. The present procedure is described, not for the purpose of advocating its adoption by other laboratories, but as a guide for the discussion of certain features.

The outfit furnished for submitting whole blood for all purposes is the Keidel tube. This is more expensive than a plain test tube or vial, but this expense is willingly borne by

* Read before the Laboratory Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936.

TABLE I

Clot Cultures of 28,066 Specimens Blood

Year	Total Specimens	Positive Clot Cultures						
		B. typhosus	B. paratyphosus				Br. suis	
			A	B	C	Total		
1926	431	92	..	..	..	..	..	
1927	828	134	..	..	..	..	..	
1928	1,241	134	3	1	..	4	7	
1929	1,942	175	3	..	..	3	6	
1930	2,569	322	..	5	..	5	4	
1931	3,345	410	4	2	..	6	9	
1932	3,687	390	1	7	1	9	4	
1933	4,118	284	..	..	..	0	6	
1934	4,846	399	..	5	3	8	12	
1935	5,059	346	..	2	3	5	6	
Total *	28,066	2,686	..	..	..	40	54	

* In addition 2,836 specimens were examined by serological tests only.

the physicians who have long ago come to consider the convenience of a sterile complete outfit ready for use at the home bedside well worth the price. Since most of the outfits are used for syphilis serology, the information blank is arranged primarily for this purpose. Space is provided so that the clinician may request serological tests for fevers and blood culture. All specimens accompanied by such special requests are referred to a separate department of the laboratory and subjected to the procedures herein described.

THE CLOT CULTURE

The tube is opened and enough serum is removed aseptically to provide for all serological purposes, including Wassermann and Kahn test, if requested. The balance, consisting chiefly of the clot, is transferred to such liquid medium as is best suited for the desired purpose. If enteric fever is suspected, Conradi's bile medium is used; if septicemia, the clot is first comminuted by forcing it through the nozzle of a sterile 10 c.c. syringe into glucose broth or Kracke's [1]

TABLE II

Agglutination Tests on 30,896 Specimens

Year	Total Specimens	Positive Agglutinations			
		Typhoid	Typhus	Undulant	Tularemia
1926	431	252	5		
1927	828	407	57		
1928	1,241	468	35	20	
1929	2,003	816	97	29	59
1930	2,950	1,133	244	40	58
1931	3,530	1,084	189	58	34
1932	3,836	918	305	56	31
1933	4,785	437	514	49	32
1934	5,523	448	399	74	80
1935	5,769	408	524	59	46
Total	30,896	6,371	2,369	385	340

brain liver infusion broth. The technic of comminuting clots was devised by the author and has been described in a previous publication.[2] Recently desoxycholate broth has been added as an alternative, or for use in parallel with Conradi's bile. The liquid media are all put up in wide mouth 2 ounce Packer bottles closed with U-Press-It caps.

After inoculation, the culture bottles are stacked in metal racks each holding 8 bottles, and provided with holes for the insertion of sub-culture slants.

After overnight incubation, sub-cultures are made on infusion agar slants and the cultures and sub-cultures are returned to the incubator. Replants are made from the bile cultures on the same agar slants each day for 4 days, unless growth occurs in the meantime. The broth or Kracke cultures are transplanted only every 2 or 3 days, and in the absence of growth on the slants are kept under observation for 10 days or 2 weeks.

If *B. typhosus* is present in the clot, growth will appear as a rule on the transplant after the first 18 to 24 hours' incubation. Table III shows the incidence of delayed growth in a series of 2,126 positive cultures.

When the growth on the agar slant is obviously a contamination, further transplants are made on Endo, bismuth sulphite, and Leifson's[3] desoxycholate citrate, which tend to inhibit further growth of contaminants and allow the enteric group to grow. It is not necessary to detail the method of specific identification of organisms thus isolated. Those suspected of being pathogenic are subjected to as many critical tests as are necessary to establish identity. The plan of identification is quite similar to that described by Coleman.[4]

TABLE III

Showing Incidence of Delayed Growth of B. typhosus in Conradi's Bile Medium

Growth on Transplant (Hours)	*Number Cultures Positive*	*Per cent*
24	1,683	78.9
48	315	14.9
72	97	4.7
96	31	1.5
Total	2,126	100.0

Harris of our laboratory has recently experimented with plain sodium desoxycholate broth as a substitute for Conradi's bile salt, and found it to be not only quite as satisfactory in growing *B. typhosus*, but more inhibitive of the development of Gram-positive contaminants. In a series of 1,000 specimens cultured in both media in parallel, the incidence of contaminations was reduced to 35 per cent by the desoxycholate broth.

As is shown in Table I, *B. typhosus* was isolated 2,686 times from clot cultures. Table IV shows the relationship of 2,064 positive clot cultures to the macroscopic Widal test.

It is shown that the sera of 40 per cent of over 2,000 positive clots gave negative or doubtful Widal reactions, as

TABLE IV

Relation of 2,064 Clot Cultures Positive for B. typhosus to the Macroscopic Widal

Total Positive Cultures	*Widal (Mean Readings)*				
	Negative	*Doubtful*	*Weakly Positive*	*Positive*	*Strongly Positive*
2,064	600 or 29%	241 or 11.6%	323 or 15.6%	339 or 16.6%	561 or 27.2%

TABLE V

Variability of the Widal Test as Compared with the Blood Culture in a Study of 14 Cases of Typhoid in a Milk-borne Outbreak

Date 1933	*Case*	*Number Days Ill*	*Macroscopic Widal*	*Blood Culture*
11/ 4	N. G. 1	8	+	Positive
	N. G. 2	10	+++	Positive
	C. J.	1	—	Positive
11/ 7	Mrs. H.	4	++	Positive
11/ 8	J. L.	4	—	Positive
11/ 8	C. H. 1	7	—	Positive
	C. H. 2	9	—	Positive
11/10	E. P.	5	+	Positive
	V. C.	4	—	Positive
11/14	R. C. E.	10	+	Positive
	R. C. E.	16	+++	Positive
11/13	D. S.	7	—	Positive
11/16	Mrs. E.	4	++	Positive
11/14	W. J. H.	4	—	Positive
11/16	R. E.	3	—	Positive
11/20	S. P.	13	+++	Positive

compared with 60 per cent which gave significantly positive Widals. Since no data are available regarding the duration of fever at the time these specimens were collected, it is difficult to interpret these results. They do indicate, however, the unreliability of the Widal test.

Table V illustrates the efficiency and practical application of the blood clot culture. This pertains to an explosive milk-borne outbreak of 15 cases of typhoid fever occurring in a small town 150 miles south of Atlanta in 1933. Blood specimens from 14 were mailed to the laboratory in Keidel tubes by local physicians. All yielded positive clot cultures. It is interesting to note the inconstancy of the Widal in this series. The 15th case was a child too small to be bled, but a stool culture was positive. Two other cases of fever occurring in the vicinity at the same time were presumptively diagnosed as typhoid, though serological studies later revealed that these were endemic typhus.

Organisms of the paratyphoid group were isolated only 40 times, as compared with 2,686 isolations of *B. typhosus*. Since the paratyphoids grow just as readily in the media employed as does the typhoid bacillus, it is the writer's opinion that this is a fairly accurate index of the low incidence of paratyphoid infection in Georgia.

Brucella suis was isolated from Conradi's bile 54 times (see Table I). *Brucella abortus* was obtained only once and this was from a broth culture.

SEROLOGICAL

After the serum of the specimen has been cleared by centrifuging, it is set up by the usual macroscopic tube technic against the antigens of typhoid, typhus, Brucella and *B. tularense*. The final dilutions range from 1:40 to 1:360, or higher as occasion demands. Incubation is at 37° C. for 4 hours, then overnight in the ice box.

The antigens are:

1. Typhoid "O" prepared by the alcohol method of Bien,[5] using a smooth strain known as "Mitchell."

2. Weil-Felix—Suspension of a fresh *living* culture of Proteus X19 derived from *smooth* or "O" colonies.

3. Brucella—Suspension prepared from *Br.*

suis—killed by heat 62–65° C. for 30 minutes and preserved with 0.2 per cent formalin.

4. Tularemia—Suspension prepared according to method of Francis.[6]

RECORDING OF REACTIONS

Reactions in each tube are recorded as from zero to 4 plus, according to the degree of sedimentation and flocculation. These readings are translated in expressions of negative, doubtful, weakly positive, positive, and strongly positive, rather than in terms of the actual titers for each dilution. It was felt that since the laboratory worker is more familiar with the normal limitations and specific behavior of each antigen, this plan would be less confusing to the physician. For example, one should be more conservative in interpreting a 4 plus reaction at dilution 1:160 for typus than the same reading for undulant fever or tularemia, since the former is much less specific.

When considerable degree of agglutination occurs with 2 or more antigens, the one showing the highest titer is as a rule (not always) the most significant. When such multiple reactions occur, the report is accompanied by a letter cautioning the physician to apply his clinical differentiation more closely and requesting a second specimen. In this letter the normal limitations of each antigen, anamnestic phenomena, delay in specific agglutinin production, etc., are discussed. It has been the writer's experience that stereotyped form letters or printed interpretations are inadequate. In other words, it is often necessary to individualize the case. The average physician will read and appreciate a personal letter all the more if he is dealing with a case difficult of diagnosis. Incidentally many such obscure cases are encountered by southern practitioners who are constantly beset with the problem of early differential diagnosis of such infections as malaria, typhoid, typhus, undulant fever, and tuberculosis, all 5 of which may so simulate each other clinically as to defy early differentiation.

Unfortunately, serology is of very little value in early diagnosis. For the first week after onset of fever, be it typhoid, typhus, or undulant, the physician must rely solely on clinical findings. If he is dealing with typhoid fever, well enough for he has recourse to blood culture; if typhus, he may wait until well into the second week for a positive Weil-Felix test. Since brucellosis rarely begins with an acute onset, the physician as a rule does not see the patient until many days after onset and until specific agglutinins have formed in abundance. In this respect, tularemia often presents puzzling problems, since not all cases present the classical findings and history of exposure.

Nevertheless, in spite of many complicating and limiting factors, serology is an invaluable aid in the differential diagnosis of fevers.

THE WIDAL TEST FOR TYPHOID

While the Widal test, either micro- or macroscopic, continues to enjoy popularity in the laboratory diagnosis of typhoid fever, it is beset with serious limitations, such as:

1. It is of little or no value for early diagnosis. Fortunately the blood culture has now been developed to supply this need.

2. Interference by vaccine agglutinins. A large portion of our population has at some time received typhoid vaccine. While the agglutinins produced thereby may have subsided below the measuring point, they are very apt to flare up at any time under the exciting influence of other fever producing infections (the so-called anamestic phenomenon). Recent development of our knowledge of flagellar and somatic, or H and O, or smooth and rough agglutinins, have made it apparently possible to distinguish between vaccine and infection agglutinins. So far, however, this distinction is too controversial

and unreliable to warrant practical application. The writer and his coworkers have for several years been using an alcohol killed or "O" antigen exclusively, but have encountered many inconsistencies which confuse both the laboratorian and the physician. Until such time as immunologists have come to agreement and have given us a more specific practical technic, we shall regard the Widal test for typhoid fever as of questionable value.

THE WEIL-FELIX TEST FOR TYPHUS

Endemic typhus has assumed proportions of an important public health problem in Georgia. During the past 5 years 1,963 cases have been reported. Of 485 cases reported in 1935, our laboratory aided in the diagnosis of 240. In the Weil-Felix test the antigen is prepared with *B. proteus* X19, an organism which apparently has no relation to the causative agency of typhus. It is not surprising, therefore, that proteus agglutinins produced by conditions other than typhus are encountered. Such is the case. A recent investigation was made of the clinical histories of 116 specimens which gave weakly positive and positive Weil-Felix reactions. Of 66 showing complete titers at 1:160 dilution, 33 per cent proved ultimately to be specific for typhus. Of 50 showing complete titers at 1:320 but not higher, 72 per cent proved specific. This indicates that in the absence of typical clinical findings the physician should be on his guard in interpreting the diagnostic significance of Weil-Felix titers under a dilution of 1:320 of patient's serum. When in doubt he should submit a second specimen. If his patient has typhus, the titers will climb rapidly; if not, the titers tend to remain stationary.

Care should be taken to keep the antigen "smooth" and to use only living suspensions.

BRUCELLA

The agglutination test for undulant fever is highly specific. While any one of the 3 species of Brucella may be employed as antigen, *Brucella abortus* is more commonly used. So far we have used only the tube method, but a recent trial of Huddleson's rapid slide technic proved quite satisfactory. All reactions complete at 1:320 or higher are reported as positive and a follow-up of the clinical history is made. Very rarely does a reaction reported as positive prove to be nonspecific. In a few instances the patient had no symptoms, but gave a history of a previous attack, or had been closely associated with infected animals.

TULAREMIA

The most specific of all agglutination reactions is that for tularemia. For many years we have used suspensions of *B. tularense* No. 38 obtained from the National Institute of Health. This is supposedly a non-pathogenic strain, hence the risk of infection among laboratory workers is minimized. Cross-agglutinations with *Brucella abortus* are occasionally encountered, but rarely cause serious difficulty.

Of 43 cases of tularemia reported in Georgia in 1935, 39 were confirmed by agglutination reactions.

The routine testing of all specimens of liquid blood submitted for purposes other than syphilis serology results in the detection of many cases of typhus, undulant fever, and tularemia. It is the writer's opinion that this service has done more to popularize the laboratory and to acquaint the general medical profession with these relatively new diseases than any other agency.

THE FECES CULTURE

The use of the feces culture as an aid in the early diagnosis of typhoid fever has always been limited for the following reasons:

1. While typhoid organisms are probably

present in the intestinal contents at onset of fever or even before, they are relatively few in number as compared with the myriads of colon bacilli and related normal inhabitants. Not until about the end of the second week of fever are they released through the biliary system and necrotic Peyer's patches in sufficient numbers to be found readily by the usual cultural methods.

2. No differential plating medium has yet been devised which consistently suppresses the growth of the colon group so as to allow the typhoid colonies to develop without interference.

A most fascinating array of differential media has been developed. Most of these are based on biochemical reactions of metabolic by-products of various types of organisms with certain indicators producing colonial color contrasts. Among those most widely used are Endo's agar, Levine's methylene blue agar, Krumwiede's brilliant green agar, and MacConkey's neutral-red-bile-salt-lactose agar. While these and many others less widely used are useful, especially for isolating the paratyphoids and the dysentery group, they all fail sufficiently to suppress the growth of the normal intestinal flora to permit the detection of *B. typhosus* when present in small numbers. He who devises a medium which meets these demands, which is simple of preparation, and produces consistent results in the hands of the majority of workers, will indeed make a great contribution, not only in improving the efficiency of carrier detection, but also in rendering feasible feces culture as a means of early diagnosis of enteric infections.

In the writer's experience, the bismuth sulphite agar devised by Wilson and Blair [7] goes far toward meeting the desired requirements. This medium has been in use in our laboratories for 4 years. We had for many years relied upon Endo's and to some extent Levine's eosin-methylene-blue agar for the plate culturing of feces previously. Over these the medium of Wilson and Blair possesses the following advantages:

1. *B. coli* and its relatives, while not always completely suppressed, grow so scantily that *B. typhosus* colonies have ample room to develop.

2. The typhoid colony with its large smoky halo is easily detected even in the presence of heavy growth of other organisms. The fewer the typhoid colonies, the larger their reactive zones and the more characteristic they appear.

3. Bismuth sulphite plates may be heavily inoculated with feces with very little danger of overgrowth, except from the typhoid bacillus itself. This is of considerable advantage in mass culturing of large groups of food handlers. We have found that even one plate per specimen of bismuth sulphite agar will yield a higher percentage of positive findings than several plates of Endo. This saves much time and material.

On the other hand, certain disadvantages must be admitted—

1. Bismuth sulphite agar does not produce distinctive colonies for the paratyphoids. *S. Schottmuelleri* at times produces colonies with dark halos, but not consistently so. Furthermore the various members of the *B. dysenteriae* group do not grow at all.

2. Characteristic colonies of *B. typhosus* require 36 to 48 hours to develop.

3. Bismuth sulphite agar is more difficult to prepare, at least according to the experience of others. We rarely experience this, and after adopting the latest modifications [7] we find it no more difficult than Endo to prepare and preserve.

4. Poured plates apparently deteriorate after 2 or 3 days. However, the media ready for use may be stored in bottles with airtight stoppers and kept in the ice box for many months without losing sensitivity.

The objection was raised by one correspondent that not all strains of *B. typhosus* will grow on bismuth sulphite agar. This may be true of certain old laboratory strains, but not for those freshly isolated. For example, 113 strains isolated from blood grew typically on bismuth sulphite agar plates without exception. Typical colonies were also produced by such old laboratory strains as Hopkins,

Rawlings, Roseman, O-901, H-901, Watson and Ty 2 (the last 4 supplied by Felix). Two old strains supplied by Stovall of Wisconsin were the only ones which did not grow.

We have recently become interested in Leifson's desoxycholate citrate agar. It inhibits most strains of the colon bacillus considerably. Those which do grow produce red colonies in contrast to the translucent colorless colonies of *B. typhosus* and the paratyphoids. Colonial development is more rapid than on bismuth sulphite plates, requiring only 24 hours for optimum differentiation. That it does not inhibit the paratyphoids and the Flexner types of the dysentery bacillus is another point in its favor. Frequently, however, the plates show a heavy growth of more or less colorless colonies which on critical inspection are obviously not typhoid or paratyphoid, but which interfere with the detection of the latter when present in small numbers. Herein bismuth sulphite has a distinct advantage, in that the fewer the typhoid bacilli in a given specimen, the larger and more conspicuous the colonies on bismuth sulphite.

We are now experimenting with Leifson's Selenite F enrichment medium as a substitute for or alternative of Teague's glycerine saline, but are not prepared to report results.

SUMMARY

1. The task of examining over 30,000 specimens of clotted blood for typhoid and certain clinically similar fevers has led to the development of a technic which the writer believes to be practical and reasonably efficient. This technic is described.

2. Among 2,686 positive clot cultures, the paratyphoids A, B, and C were found only 40 times. This is a true index of the relative rarity of actual paratyphoid fever in Georgia.

3. The Widal test is not a reliable procedure in the laboratory diagnosis of typhoid fever.

4. The limitations of the Weil-Felix test for typhus are discussed.

5. Feces cultures should play an important part in the early diagnosis of typhoid. The need for more efficient differential media for this purpose is emphasized.

6. Bismuth sulphite agar is in the writer's experience superior to any other plating medium so far devised for the isolation of *B. typhosus* from feces.

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The Compensation Aspect of Industrial Hygiene*

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THE subject of occupational diseases is of more than passing importance to the National Bureau of Casualty and Surety Underwriters, representing as it does a group of some 40 casualty insurance companies, which write yearly about 100 millions of dollars worth of compensation business in the United States.

One of the major jobs with which our Bureau is charged is that of doing what it can, and all that it can, to assist in the prevention of injury to workers in industry, whether that injury results from accidents or from disease. We therefore have a common interest with the manufacturer in the prevention of disease—especially those diseases commonly considered occupational whether compensable or not.

Almost since the beginning of compensation, the compensation laws have gradually been liberalized by statute or by interpretation. Such liberalization naturally increased the number of accident claims and the number of occupational disease claims, and particularly the number of claims allowed. In the last few years, moreover, occupational disease claims have grown at an alarming rate. They represent today one of the important problems of industry.

It must be remembered that any increase in the cost of compensation, due, for instance, to compensating for occupational diseases, ultimately passes on to industry. It is no exaggeration to say that the financial life of some of our most important industries is at stake, and serious effects will occur if measures are not taken to remedy the conditions causing occupational disease.

It must also be remembered that, in the final analysis, the people in each state are the ones who decide, through legislation and through their courts, what compensation is to cost the industries in that state and to what extent the people themselves are willing to pay increased compensation costs through higher prices for all the commodities they buy. Within the scope and the provisions of any given compensation law, the costs to the industries, and then to the people of that state, can be kept to a practical minimum only by and with the coöperation of the state authorities—and in that important group I include, as of very great importance, the state health authorities.

When one considers that the effects of many occupational diseases may be permanent, that some of them are not subject to cure in the ordinary sense of the word, it is apparent that the answer to the occupational disease problem lies not in compensation, but

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in the strictest measures for the prevention of the diseases themselves.

I need not go into the conditions and factors causing occupational disease—you are more familiar with these than am I—but we are all agreed, I am sure, that occupational diseases are caused by the unhealthful industrial environmental conditions incident to the occupation of certain of those engaged in industry, and, further, that these unhealthful environmental conditions may not only cause occupational diseases, but also increased incidence of disease among the general population. Furthermore, I am sure that we all agree that they should be controlled.

In order to indicate the importance of the occupational disease situation, I present the following figures, which by no means include all the striking cases which could be cited, but at least give us some idea of the extent of the problem.

Perhaps the most complete figures available to us are those showing the experience in South Africa. According to the 1932 report of Miner's Phthisis Prevention Board, an aggregate of $65,000,000 has been paid for compensation of silicosis alone, with an additional $34,000,000 liability outstanding. The amount awarded for silicosis in the year 1932 was $6,000,000. A number of the individual states have larger groups of wage earners in the manufacturing and mining industries than has the Union of South Africa. Furthermore, instead of merely the one problem of silicosis—to be sure of great importance—there is a considerable number of occupational disease problems confronting you in the wide diversity of occupational disease hazards existing in our industries.

In the County of Cumberland, New South Wales, the Workmen's Compensation Commission reports, with relation to workers exposed to silica dust, and over approximately 5 years ending March, 1932, that their expenditures for compensation, medical expenses, committee fees, staff salaries, office and administration charges total approximately 6 per cent of the pay roll of the workers exposed to such dust. The expenditures for compensation and medical expenses alone average about 5.3 per cent of the pay roll. On a normal casualty insurance basis that would be equivalent to a compensation rate of approximately $9 per $100 of pay roll.

In Ontario, the Compensation Board has paid up to January 1, 1934, a total of $880,000 for compensation and medical aid for silicosis.

In both South Africa and Ontario, health organizations are conducting outstanding work along preventive lines. In South Africa the "attack rate" of silicosis has been remarkably reduced through the efforts of health authorities. In Ontario, a Bureau of Industrial Hygiene in the Department of Health is making noteworthy progress in coping with the occupational disease situation.

During the present decade, and in the United States in particular, compensation payments for occupational disease have been increasing tremendously, both as a whole in comparison to the total payments for compensation for accidents and, even more strikingly, in individual classifications of industry where occupational disease hazards are severe.

In Massachusetts, the compensation insurance rate for stone cutting per $100 of pay roll was raised from $2.84 to $4.77 in December, 1927. However, many carriers requested and received approval of a $10 rate for many risks. Later, because of wage reductions, a $12 rate was approved for a period beginning June, 1932, but by

November 1, 1932, no company would write the insurance at that rate.

The present rate is $5 plus an additional occupational disease hazard payment of $300 per year for each employee ($25 per month for any employee on the pay roll during all or any portion of any calendar month).

The $300 per capita rate was based on the fact the experience for stone cutting for the policy years 1926 to 1930 inclusive disclosed a total of 92 pneumoconiosis cases, with an incurred loss of $288,075, the average claim cost being $3,131. It was estimated that many employees then in the industry would within the next 10 year period develop the disease, making it necessary to collect over that period the sum of $3,000 per man.

In Wisconsin, the total amount of actual indemnity paid in all occupational disease cases is reported as being about $52,000 in 1922 and about $251,860 in 1933, the cost having increased virtually fivefold in 11 years.

Another group of interesting figures can be taken from the National Council on Compensation Insurance report for the policy year 1933. Four states—California, Connecticut, Massachusetts, and Wisconsin—show total losses from pneumoconiosis of $385,662, and a total of $175,184 assigned to diseases other than pneumoconiosis—a grand total for all occupational diseases of $560,840.

The foregoing figures serve as tangible evidence of the monetary costs of occupational diseases. It is perhaps unnecessary for me to explain that compensation insurance rates are based on the actual compensation costs in a given industry, and are therefore a reflection of conditions existent in that industry.

The figures I have presented relate primarily to compensation costs. There are other, and perhaps greater, costs with which you, as health authorities, are more familiar than I am. Those are the indirect losses which are the resultants of disease. They include the waste involved when life expectancy is shortened, with the cost to the state when morbidity rates increase due to inadequate preventive measures. The economic waste resulting from occupational disease may be greater in proportion than that accruing from the usual run of diseases, due to the fact that the wage earner is the one primarily disabled. Impairment of the wage earner's health may affect the general welfare and health of his family. I leave it to you to evaluate the costs to the state which are to be superimposed upon those for compensation which I have presented to you. From an economic point of view alone, the occupational disease problem is one of commanding importance.

Money spent by an individual or a community may be classified as either an expense or an investment. It has become generally recognized that money spent in behalf of health represents an investment of the first order.

The National Bureau of Casualty and Surety Underwriters realize that the only solution of the occupational disease problem lies in the correction of the conditions causing those diseases—in their prevention. The manner in which this may best be undertaken has been given careful consideration.

The reports of the Industrial Hygiene Committee of the State and Provincial Health Authorities of North America for the past several years, provide ample evidence that health authorities have given this matter their most serious attention.

It is the health department which is concerned with mortality and morbidity rates, and, if faulty industrial conditions increase those rates, both

for the diseases not specifically occupational, and also for the specific occupational diseases, such as silicosis, asbestosis, benzol poisoning, lead poisoning, etc., the power to prevent disease should rest with that department.

The problem of prevention cannot be solved by industry alone and of itself, because few industries possess complete information from a medical standpoint as to the results to be expected from the use of many of the materials which may enter their products or their processes. Few industries possess laboratory facilities sufficiently adequate, or personnel sufficiently well trained, to enable them to evaluate and control the occupational disease hazards which may exist in their own raw materials, processes, and products.

The public health authorities have repeatedly stated that health is purchasable. The amount of disease prevention work that you are capable of doing is dependent to a considerable measure upon the amount of money provided, and this amount in turn is dependent to a considerable extent upon the service that you are providing to the public and to the various groups which make up the community.

May I bring to your attention the fact that, in undertaking the prevention of occupational disease, you will be in close contact with industry, labor, and insurance interests, as well as with the community as a whole, and that you will be conferring inestimable service upon them which should be reflected in the amount of money provided for your activities.

We believe that within the department of health, there should be a bureau or a division specifically charged with prevention of occupational disease.

CONCLUSION

The desirability of organizing a bureau of this type in the state department of health has been shown by the results obtained in the State of Connecticut where such a bureau has been conducting occupational disease control activities for the past 8 years. I believe that similar units which have been organized during the past year in 17 state health departments will soon be in excellent position to control the occupational disease situation in their respective states.

It is particularly fortunate that most states have vested broad powers in the department of health, charging these departments with the prevention of disease and authorizing them to maintain supervision over the health of the people. In some states enabling legislation may be desirable or necessary to undertake control of occupational disease, but apparently no such legislation was required for organizing or assisting the bureaus of industrial hygiene in health departments of 17 states during the past year, and these represent the great majority of the industrial states of the country.

We are all interested primarily in *prevention* of occupational diseases, and I can assure you, wherever the stock casualty insurance companies can render assistance to the program of the health authorities in occupational disease control, they will gladly extend their services.

Progress in Industrial Sanitation*

With Special Reference to the Control of Industrial Dust

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OCCUPATIONAL diseases are controlled, primarily, by maintaining proper working conditions. This is an engineering problem to a very large extent although a complete program of industrial hygiene requires the closest coöperation between the medical, engineering, and chemical specialists in this field. Together they discover the principal causative factors and their relative importance in the production of a certain industrial disease. Through proper correlation of such data as concentration of toxic substances at the various work places, length of exposure, and sickness and mortality experience among the exposed workers, they may be able to estimate maximum permissible concentrations of toxic gases or dusts which can be tolerated without harm. Employing such figures as criteria, certain conclusions may be reached with respect to the efficiency of control effected by different methods and equipment. Basic engineering data are obtained from which it is possible to develop systematic procedures of design carrying with them reasonable guarantees of efficient operation of the resulting equipment.

Complete coöperation as outlined has been employed only in the investigation of a few industrial diseases. In general, it may be said that physiological and medical knowledge of the causes and manner of action of occupational diseases has outstripped the development of effective methods of engineering control. The latter have been to a large extent empirical. Owing to the absence of basic standards against which to compare results and to the absence of practical measuring instruments as well, control equipment has not been tested—as a steam turbine, for example, is tested after installation to determine its efficiency. The manufacturer of control equipment has been required to guarantee only those results required by governmental regulations. There has been no great amount of money available for research and development of new, more efficient, and less costly methods and equipment.

The recent general recognition of employer responsibility for occupational diseases by the courts and in workmen's compensation acts has added greatly to the importance of control equipment from the standpoint of efficiency, and cost, *per se,* has become less important than heretofore. This has made it essential to replace empirical rules of design with fundamental

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engineering methods. Equipment for the control of hazardous substances must now be purchased under the same basic type of performance guarantee and maintained in the plant with as much care as any other parts of the production equipment. Unless this is done, compensation costs may become prohibitive.

Industrial dust is regarded as an outstanding hazard in many manufacturing establishments. The problems associated with its control are typical of the whole field of industrial sanitation, and a discussion of them will indicate the progress that has been made and the problems that are to be met in the future of this relatively new field of public health engineering. From an engineering standpoint, consideration must be given to 3 aspects of the problem: (1) measurement of dust concentration, (2) evaluation of the dust control program in terms of permissible dust concentration, (3) development of basic methods of design.

DUST DETERMINATION

The history of atmospheric dust determination extends over more than 100 years. The early investigations were concerned entirely with the living matter in the air, however, and it was not until the beginning of the present century that attention was directed toward inorganic dust in industry. Arens in Germany, and Haldane and Crichton-Brown in England published some of the first quantitative data. Earliest measurements of dustiness in the South African gold mines were made about 1902, but it was not until 1916 that the present extensive program of routine dust determination was inaugurated there. Since then thousands of samples have been collected annually in these mines. In the United States pioneer work was done by Ditman and Graham-Rogers, the latter carrying out investigations for the New York Department of Labor as early as 1909. The first American dust sampling instrument to be extensively employed was the Palmer water spray apparatus (1916) which was adopted as the standard instrument by the American Public Health Association, but this and other instruments were largely supplanted by the impinger introduced by Greenburg and Smith in 1922. This instrument has been used by the investigators in the U. S. Public Health Service in their comprehensive studies of the industrial dust hazard and the data thus collected represent the most complete information available in this country. Because of this fact the impinger has come to be regarded as the standard dust sampling instrument and is so recognized in courts of law and in state codes.

The impinger possesses many characteristics required in a scientific dust sampling instrument, such as high collecting efficiency against most industrial dusts, and unlimited loading capacity which permits its use in dust clouds of any concentration. It is a bulky and fragile instrument, however, not well adapted to rough work in industrial establishments. Moreover, the quantitative examination of the collected sample is time consuming and fatiguing. The practical phase of the dust problem —routine control involving large-scale sampling—is being featured today in place of the earlier scientific studies, and a real demand exists for a method of dust determination that is more convenient and rapid in operation than the standard impinger technic.

In the selection of a new method for routine work a high degree of accuracy is not important so long as the results are consistent among themselves. The purpose of dust determination is not to measure the absolute dust concentration but simply to obtain an index of the

health hazard involved in breathing the dust-laden air. Physiological rather than physical standards should therefore be applied in the selection of any technic. In this connection, it is to be observed that studies in the dusty trades have not demonstrated a high degree of correlation between dust concentration and degree of hazard. Thus, in the granite dust study of the U. S. Public Health Service it was possible to classify dusty operations only into broad groups, such as the following:

Group A—45 ± 25 million particles per cu. ft.
Group B—35 ± 15 " " " " "
Group C—15 ± 8 " " " " "
Group D— 4 ± 2 " " " " "

The same rough separation has been employed in other studies in the United States and in South Africa investigators have found it sufficient to classify dust counts, which they regard only as "figures of merit," according to the following scale: (1) <200 particles per c.c.; (2) 200–500; (3) >500; (4) <1,000; (5) >1,000. With respect to accuracy of dust determination, then, it appears to be unnecessary to distinguish between operations which show variations in dustiness of less than 100 per cent. Failure to recognize this low degree of required accuracy has led to the unwarranted condemnation of certain methods of dust determination.

A second characteristic which should be considered in the selection of a new technic is the limitation, if any, which it places on the volume of air from which the dust sample is taken. Much has been written about the relative merits of the so-called grab sample and the sample of large volume. The statistical distinction between them disappears when the duration of any sampling period is compared with the number of *years* of daily exposure to dust that is required to produce serious lung damage. In other words, a dust sample represents only the dust concentration at the sampling time whereas the dust in the lung is the accumulation over several years. In the United States, samples from 10 or more cubic feet of air are common, but in South Africa konimeter grab samples have been found to yield results just as closely related to the degree of damage observed among the exposed workers. As a matter of fact, South African investigators consider the "dust floods" of short duration to have greater hygienic significance than the average concentration, although the statistical evidence to justify this belief is limited. Regardless of the size of the sample, the important factors are the location, time and frequency of sampling, and these are matters for personal selection in each case. Thus, it may be said that the knowledge and experience of the investigator are of greater importance than the characteristics of the sampling instrument. A large number of properly spaced dust determinations of low accuracy may be more valuable than a few samples of the highest quality.

Undoubtedly, there is need for a universal method of dust determination which will yield comparable results in all industries and all countries, but for routine dust measurement as a practical control measure, local conditions should govern the choice of instrument. The impinger will continue to serve a very useful rôle but other instruments are also required. Practical dust sampling on a large scale is new in this country, and much more experience with different types of instruments is needed before standard methods can be adopted. At present many engineers are using the impinger with the mistaken idea that it alone will furnish proper information. Contrary to this, broad experience with different types of instruments is to be recommended in

order to secure the necessary information upon which to base our selection of standard methods of some later date.

PERMISSIBLE DUSTINESS

Minimum toxic doses for many poisonous substances encountered in industry have been determined by direct experiment, usually by exposing suitable animals to various concentrations of the substance and noting the results. The threshold dose has been established with considerable accuracy in many cases since it has been possible in these experiments to consider all important variables. Clearly, this experimental method can be employed only when the reaction to the toxic substance is clean-cut and rapid, with a well defined end point, so to speak. These requirements cannot be met in the case of silica dust and as a consequence animal experimentation is too expensive and time consuming to permit its use on the large scale required to produce the necessary data. The only scientific basis for determining the safe concentration of silica dust, therefore, is by direct investigation of the working conditions and the health of the workers in the dusty industries. Unlike laboratory experiments, it is not possible in field investigations to control many important variables. Conditions must be accepted as they are found and it is essential therefore that the conclusions reached from any one study be carefully limited. Several standards of permissible dustiness have been proposed as a result of such studies, but with respect to these a recent report from the British Home Office states that "such standards may be of value in estimating the relative efficiency of the methods used for suppressing dust in a single industry, but it would be wrong to adopt any of these standards as the measure of safety under different conditions and in other industries." This opinion is in direct agreement with the warnings sounded in the original reports from which such standards have come. Nevertheless, attempts have been made to plot a curve with the few values of permissible dustiness and associated percentages of free silica as coördinates and to interpolate or extrapolate from this curve to obtain the standard of permissible dustiness for any industry. The original studies are not in close enough agreement to warrant this, as is shown in Table I.

Of the several recommended standards, the only one which has been proved by actual experience is the South African figure. Over a period of 30 years the incidence of miners' phthisis has progressively decreased as the dustiness was reduced until the present when the dust concentration has reached 1 mg. per cu. m. and advanced silicosis practically has disappeared from the industry. It is interesting to observe that the South African standard was proposed more than 20 years ago, not as a minimum toxic dose, but as an engineering figure based upon conditions existing in the best mine in the area. That is, it was a practical level of dustiness that could be obtained by recognized engineering means.

Despite the uncertain value of any standard of permissible dustiness from the medico legal standpoint there is need for practical criteria to be employed by governmental and other agencies responsible for the health of workers in the dusty trades. It is the duty of these officials to say, for example, that according to the best knowledge available one method of control is satisfactory and another is not and for this purpose working standards must be developed. The South African experience suggests that the engineering, rather than the medical, approach to the problem should be followed. Thus, if by practical means, dustiness in

TABLE I

Standards of Permissible Dustiness

Industry	*Free Silica Per cent* *	*Recommended Safe Conc. Millions per Cubic Foot*	*Instrument Employed*
Gold-mining, South Africa	20–40	8 (or 1 mg. cu. m.)	Konimeter and Sugar tube
Sandstone drilling, Australia	80–90	5 †	Owens
Granite-cutting, United States	35	10–20	Impinger
Cement manufacturing, United States	6	10–20	"
Anthracite coal mining, United States			
(a) Hard rock	35	5–10	"
(b) Haulageway	13	10–15	"
(c) Coal getting	6	<50	"

* These figures are based largely upon examination of coarse cuttings and do not take into consideration the possible change in composition of the air-borne dust with particle size. Recent studies show that the great majority of the minute particles in the air-borne dust in South African mines, for example, are not quartz, but sericite. Thus, the Rand miners are not exposed to a dust containing 80–90 per cent quartz, as analyses of the "Banket" would indicate, but to dust containing as little as 20 per cent of free silica.

† Not based upon local studies but an estimated value arrived at from a consideration of data in other reports.

foundries can be reduced to 10 million particles per cu. ft. then this figure could properly be adopted as a practical requirement for the industry. On the other hand, nothing is gained and, in fact, the situation is confused if the dustiness standard adopted is beyond practical means of attainment.

There is a second reason for establishing a single standard for an industry rather than a sliding scale depending upon the composition of the dust—the practical matter of enforcement of regulations. The quality of inspection required and the amount of sampling and chemical analysis demanded by such a sliding scale would tax any inspection bureau beyond its capacity to perform the work and would greatly confuse the situation with respect to the matter of testing dust control apparatus for approval.

DESIGN OF EXHAUST SYSTEMS

Control of industrial dust by means of local exhaust ventilation is more common than by any other means. The basic principles of operation are the same in all exhaust systems but the details of design vary greatly from one installation to another. Exhaust ventilation has been widely employed for many years and most state codes have provided for regulations governing the design and operation of such equipment in their industrial codes. In the original development of these requirements special attention was paid to the collection of dust from grinding wheels and chips and shavings from woodworking machinery. In recent years, however, other dust producing operations having greater hygienic significance have demanded attention, and in applying local exhaust ventilation to them the limitations of the early specifications have taken on greater emphasis. A general revision of state codes governing exhaust systems appears to be necessary in order to meet the requirements of modern industrial hygiene.

In place of the empirical rules of design commonly employed in the

planning of exhaust systems, a more fundamental approach is possible. In this connection the following consideration of the problem leads to significant conclusions with respect to the problem of design of the exhaust hood, which is the most critical part of the system.

Dust dispersion—The purpose of local exhaust ventilation is to prevent the escape of dust from its source into the surrounding atmosphere. It is necessary therefore to destroy or effectively control the forces that cause dust dispersion. What are these forces?

Dust is thrown off from its point of generation into the air by the kinetic energy imparted to the particles during their formation, or it may be dispersed from a secondary resting place by some disturbing force which imparts velocity to the particles. The motion of a particle projected into still air is resisted by the air friction, which reduces the speed of the particle until it comes to rest at a distance S from its origin. At this point its kinetic energy has been completely destroyed; hence, we may write:

$$\text{K. E.} = \int_{vo}^{o} -mv\,dv = \int_{o}^{S} R\,dS$$

Where
m = mass of particle
v = particle velocity
vo = initial velocity
R = air resistance
S = distance of travel

The air resistance, R, is determined by certain well known equations which may be substituted in the above relationship and some practical values calculated.* When this is done one finds that whereas large particles (1 mm. in diameter) can be projected relatively great distances through still air, microscopic particles (of the order of 10 microns and less) are brought to rest in a distance which may be less than 2–3 cm. The practical significance of this is that for the dispersion of microscopic particles any real distance one must look for some force other than the kinetic energy of the particles themselves. This force proves to be air motion. Thus, the particles are thrown out from their origin into the air and the *dust laden air* is dispersed by convection currents and other forces that cause air movement. Hence, the problem of hood design, for the control of microscopic dust which is of greatest hygienic interest, is one of effecting control of the movement of the dust-laden air rather than of the dust itself. This is an important distinction since it leads at once to the first rule of design; namely, eliminate or reduce in magnitude all possible air motion around dust producing process; not until this is done, should the air flow through the exhaust hood be considered. The best treatment to effect this result is clearly indicated in many cases but requires extensive study in others. The value of such treatment cannot be doubted since in certain instances the required rate of air flow through the hood has been reduced 50 per cent and even more by this preliminary elimination of obvious sources of air motion. For example, the blast of air discharged against the cutting tool on the granite surfacing machine should be directed in another direction, thus greatly reducing the disturbance around the tool. The practical effect of this in one case was to reduce the rate of air flow required to capture the dust laden air from 400 cfm. to approximately 200 cfm.

Required air velocity to capture dust laden air—No matter how completely one removes the sources of air motion around dust producing machines all

* For a more complete treatment of this problem see: Design of exhaust hoods for dust-control systems, by Theodore Hatch. *J. Indust. Hyg. & Tox.*, Nov., 1936.

movement cannot be eliminated and it is still necessary to control the residual air motion. This is done by means of the air flow into an exhaust hood which creates within the zone of dust production air velocities toward the suction opening of sufficient strength to stop the outward movement of dust laden air, to change its direction, and to cause it to flow into the exhaust system. The air velocity necessary to accomplish this cannot be given with any accuracy, but some useful data are available which are of assistance to the designer in making his estimate. Velocities vary from 50 fpm., representing the minimum necessary to overcome natural convection currents, to several hundred feet a minute for a very active dust producer. According to the recent code adopted in Wisconsin, the minimum air velocity to be maintained in the zone of dust production is 500 fpm. This is a high value; probably a closer average is 200 fpm., but the actual velocity should be estimated for each case, or better, should be determined experimentally. In the case of the pneumatic hand tool in the granite industry, for example, it has been found that a minimum velocity of 200 fpm. is required to insure steady flow of all the dust laden air toward the suction opening. Experiments on a bagging machine showed that 400 fpm. is required to draw the contaminated air away. These are fundamental specifications upon which the hood design should be based. To date, air velocity requirements have been determined for only a few processes.

Rate of air flow into the exhaust hood—The air velocity necessary to capture the dust laden air can be created by air flowing into any simple suction opening provided the rate of air flow is high enough. A properly shaped hood, correctly located, must be used, however, if the device is to operate at maximum efficiency, *i.e.*, if the percentage of flow from the area of dust production is to be high and the flow from ineffective areas kept at a minimum. Even with the best design, exhaust hood efficiency is relatively low but with careful attention to certain basic laws governing the flow of air into suction openings, the efficiency can be increased significantly over common values.

The development of certain aerodynamic laws governing the flow of air into suction openings and their graphic presentation by DallaValle constitutes one of the most important recent advances in hood design. Based upon these laws, DallaValle has also developed equations for calculating the required rates of air flow necessary to create the desired air velocities around certain dust producing processes. The use of these equations and their further development offers a basic approach to the problem of hood design although it is not expected that mathematical calculations alone will solve the problem of hood design for every situation.

The simplest case is that of an unobstructed hood located a definite distance from a concentrated point of dust generation. If the required air velocity at the tool is known, the air flow through the hood can be calculated at once from the equation:

$$Q = V\,(10X^2 + A)$$

Where

Q = rate of air flow through the hood, cfm.
V = required velocity at the point of dust generation, fpm.
X = distance from face of hood to tool, ft.
A = area of face of hood, sq. ft.

Another simple case is one which permits the location of the dust producing operation wholly within an exhaust booth. By experiment it is possible to determine the minimum face velocity necessary to prevent the outward movement of any contaminated

air from the booth. Thus, Q may be calculated by means of the simple relationship:

$$Q = VA$$

Where A is the cross-sectional area of the booth at the plane for which V is known.

The rate of air flow into an enclosing or partially enclosing hood cannot be calculated directly since it is difficult to specify minimum air velocities required at well defined areas. Two conditions must be maintained: (1) the air velocity must be sufficient through openings in the enclosing hood to prevent the outward escape of dust; (2) development of sufficient air motion within the enclosure to prevent undesirable settlement of dust, but in certain cases this velocity must not be so high as to lift and carry away valuable product.

When direct calculations fail to give the necessary rate of air flow for a particular problem it is necessary to resort to experimental determination of this value. The process is isolated from other dust sources and operated with model hoods. The ventilating rate is varied and for each rate of air flow the resulting dust concentration is determined. From the curves thus developed, the most efficient hood can be selected and the minimum rate of air flow *for this particular hood* established. Direct investigation in this way may be relatively costly but the experimental study will frequently pay for itself through the more efficient and economic design thus secured.

A very large percentage of hood design problems are not well defined and must be based upon such experimental studies. Data thus obtained will be required in the development of industrial codes for many machines and processes. The collection of such information should constitute one of the most valuable functions of the engineers in the divisions of industrial hygiene in the various states.

Industrial code specifications for exhaust hoods—From the foregoing, it is clear that the air velocity created by an exhaust hood over the area of dust production is the most important index of hood operation. So far as possible, therefore, industrial codes should be written around this basic specification—since it is independent of the design or location of the hood itself. When this is not possible the minimum rate of air flow should be specified but, in this case, it is also necessary to specify the hood design since it is the combination of the two which determines the efficiency of dust control and not the rate of air flow alone.

In most industrial codes the air flow requirement is determined from a certain value of static suction at the hood throat. The relation between the two is given by the equation:

$$Q = 4000\, A\, f \sqrt{SP}$$

Where

Q = rate of airflow through the hood, *cfm.*
A = area of pipe at the hood throat, sq. ft.
f = coefficient of restriction which varies with hood design.
SP = static suction at the hood throat, inches of water.

One notes that Q is a function of A and f as well as SP. The branch pipe size is commonly specified but f is generally assumed to have a value of 0.7. This is simply an average value; the coefficient may vary from 0.3 to 0.95, a variation of over 300 per cent! Recently the velocity pressure in the branch pipe has been proposed as a more accurate measure of hood operation since with it the variable coefficient, f, is not required to calculate Q, thus:

$$Q = 4000\, A \sqrt{VP}$$

An important disadvantage of this index compared with the static suction

reading is that a great deal more skill is required in its determination.

Basically, neither the velocity pressure nor static suction in the branch pipe should be employed as a primary index since a high value does not necessarily mean high efficiency of dust control. The velocity in the branch pipe should be no higher than that required to transport the dust; any increase over that velocity simply means wasted energy. It is not the manner in which air moves within the exhaust system but rather the manner in which it flows *into* the hood that governs the efficiency of dust control.

Based upon modern concepts of the requirements of exhaust systems, specifications for design might properly include the following items:

1. The exhaust hood shall operate in a way so as to reduce and maintain the dust concentration below a certain permissible level. Many existing codes require the removal of "all" dust. This is practically impossible and should be so recognized in the code.

2. The exhaust hood shall be of such design and the air flow through it shall be maintained at such a rate that the air velocity created over the area of dust production shall be not less than a certain specified value.

3. Because of limitations imposed by the process it may be impossible to specify the minimum air velocity, as in item 2. In these cases, state the minimum rate of air flow into the exhaust hood but include, in addition, certain basic specifications governing the design and location of the hood itself.

4. The designing engineer may properly object to rigid requirements which discourage him from developing more efficient hoods. In order to encourage new developments, the code should provide for exceptions to the requirements of item 3 and allow the use of other types of hoods which are approved by actual test. This provision is important since it is desirable to foster research and the use of more basic engineering factors in the design of exhaust systems.

5. A minimum velocity in the exhaust piping should be specified in order to insure continuous removal of the collected dust. This velocity and the required rate of air flow together will determine the size of the branch pipe and the velocity pressure to be maintained in it. The static suction will also be determined if, in addition to these, the coefficient of restriction for the hood is also given. It is important that one of these indices be known because they constitute the best practical measure to be employed in the field by the inspector who is responsible for the proper operation of an exhaust system. They should be determined however from other more fundamental specifications, and not appear themselves as primary requirements.

Inaugurating Grade A Pasteurized Milk in the City of Chicago*

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MEDICAL science is a vital, moving, progressive force which, in a large city, affects the well-being of every person.

Ordinances and statutes covering health matters, of necessity, from time to time must be altered in view of the progress through scientific endeavor. Nowhere has this been more clearly shown than in the history of the ordinances designed to control milk supplies.

The need for the tuberculin testing of cows, the need for better sanitation on dairy farms, the growth of large cities making it necessary that milk be shipped over long distances, are but a few of the factors which have made changes in the milk ordinances necessary.

Unfortunately, the amending of ordinances does not always give a satisfactory law. There are apt to be contradictory passages. Definitions, unless clearly set forth, are apt to differ in the minds of those who propagated the original ordinance and those who add the amendments. The ordinance for the control of milk supplies under which Chicago was operating up until 1935, was of this type. Various amendments had been made to the original from time to time. adopted evidently for the purpose of incorporating new ideas in milk sanitation, or because of legal necessity demonstrated by court trials. In 1934, the city of Chicago was involved in a lawsuit in which the reasonableness of the milk control laws was attacked. Fortunately, the plaintiff's case was weak and the city won the suit. However, during that trial, it was clearly demonstrated that in Chicago the existing milk control laws were wofully weak and dangerously insufficient. Since the ordinance was not similar to any standard ordinance and was unlike ordinances in other parts of the country, it was difficult to establish in the mind of the court its approval by scientific bodies. It is likely that the same condition exists in many American cities today.

The manner in which milk ordinances are formulated often makes certain provisions in them contradictory. After an ordinance is passed, frequently years later it is amended and re-amended, and the amendments may contradict provisions of the original. Should the ordinance be attacked, the court has difficulty in arriving at a decision. Moreover, enforcement of the ordinance is difficult when there are contradictory provisions in it.

It was discovered that the ordinance under which Chicago was operating was of this old, often amended type. These numerous amendments weakened the ordinance as a whole. Close systematic inspection of farms and plants was not provided for, and enforcement agencies

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were given a false sense of security. Further, the contradictions made it almost impossible to defend the ordinance in the courts.

At the conclusion of the trial referred to, we recognized that there was need for a complete change in the laws governing the sanitation of milk supplies. After a careful study of the existing ordinance with its amendments, it was not deemed feasible to attempt alterations to make it fit conditions. We concluded that the wisest procedure was to set up the best possible ordinance and to alter the conditions under which milk was produced and handled to fit the ordinance, instead of attempting to change the law to fit conditions which then prevailed.

1. It is our opinion that a milk ordinance, to be workable, must first have been tried out and shown to be legal in all its aspects and, therefore, able to withstand the test of court trials.

2. It must include all of the modern practices for the control of milk supplies, if these practices have been tested and found workable.

3. The ordinance must be sufficiently flexible so that changes to include legally the latest developments in milk sanitation may be easily brought about, but not be so flexible that improper interpretation is possible.

4. It must be complete in all details so as to permit a uniform enforcement in all areas. This is of particular importance in a milk shed which is as large as that of Chicago.

5. It should be so constructed that at all times it is possible to determine whether or not it is being adequately enforced. There should be a definite yardstick by which to measure enforcement.

In other words, the rules and regulations must be so clearly outlined that it is easy for inspectors uniformly to determine conformity with the provisions.

We found that the standard milk ordinance of the U. S. Public Health Service included these 5 requirements. It was, therefore, prepared for adoption after making certain upward revisions.

The sale of milk and milk products, including the ingredients of ice cream, was limited in Chicago to grade A pasteurized and certified milk and milk products.

A time limit was placed on the sale of milk and cream to insure their freshness, making storage for any great length of time illegal. A schedule of license fees was included.

On December 12, 1934, this ordinance was presented to the City Council and was referred by that body to its committee on health. Following a public hearing before this committee, at which milk producers, distributors and consumers approved of it, the ordinance as prepared was reported favorably back to the City Council who adopted it unanimously January 4, 1935.

On January 8, 1935, the Board of Health of the city of Chicago adopted the U. S. Public Health Service Milk Code as regulations for the interpretation of the ordinance. It is obvious that no matter how ideal an ordinance may be, unless it is adequately enforced, its value is lost. The enforcement officer must be completely familiar with the ordinance he is attempting to enforce and must understand exactly what constitutes compliance.

He must be courageous and, most important of all, he must be backed up by a courageous mayor or other governing officer who is in sympathy with the purpose of assuring a pure, safe milk supply for the citizens, and will resist outside interference for personal gain. Chicago's chief executive has given his whole-hearted support to seeing to it that there has been no interference with its enforcement. Should a health offi-

cer know in advance that he will not be able, without interference, to close the largest and most influential dairy farm or pasteurization plant because of the violation of any one or more grade A items, it would be well for him to have the ordinance include the power to degrade a supply as well as the power to revoke permits.

The direct enforcement officers of a milk ordinance are the inspectors. Therefore, a school was established to instruct the field force in the details of the ordinance and code so that the enforcement would be uniform, each inspector using the same yardstick in determining compliance. The field inspection forces of milk distributors' and producers' organizations, and all others interested in the enforcement of the program, were invited to attend the school. In this way we felt that all interpretations of the ordinance and code would be as uniform as possible.

So often when violations of ordinances occur, they are due to a lack of understanding of the provisions by those who have violated them.

New ordinances which are passed are given varying amounts of newspaper publicity. After the passage of an ordinance, publication is required in the official newspaper of the city, but unless a direct effort is made to inform all those concerned of the passage of such an ordinance, there would be many who would continue to operate in ignorance of its provisions.

Often there is a lack of sympathy with the provisions of an ordinance by those whom it affects because they do not understand it, and are not made aware of its purpose.

Since the passage and enforcement of the grade A ordinance in Chicago, as the dealers and producers have become better acquainted with the purposes behind it, they have become more and more favorable to it because it brought improvement in their products and helped stabilize their market which meant increased sales.

Immediately after instruction of the inspection force, plants and farms were visited by the inspectors to teach both producers and distributors the requirements of the ordinance and the regulations of the code. This was carried on as rapidly as possible but the inspectors in urging enforcement were advised to use all possible diplomacy.

However, it consumed some time because each inspector was impressed with the need of thoroughly explaining each item and for helping the producer and distributor to comply with as little expense to them as possible.

In public health work, after years of experience, I have been impressed with the fact that when starting on a program it is usually pushed forward with enthusiastic effort; but, like a pendulum, the enthusiasm with which the new project is launched gradually drops away. Then, often a new project is taken up and the others are forgotten. So it is in a milk control program. It is necessary to hammer away continually at enforcement else gradually violations occur, and soon the major provisions become non-operative.

When the first inspection sheets under the new milk ordinance were received, it was evident that efficient milk sanitation did not prevail and that the adoption of the new program was not only wise, but necessary.

The first inspection rating of the Chicago pasteurized milk supply, based on the survey standards of the U. S. Public Health Service, showed only 59 per cent compliance, while we had believed it to be better than 90-per cent.

What was to be done in order to bring about compliance? Three things were necessary: (1) to find out where corrections were needed, (2) to order that such corrections be made, and (3)

to see that the corrections were carried out.

We felt that to carry out successful control of the milk supply, a complete record filing system was necessary. Therefore, we adopted the system which included all of the features of the ledger plan used by the U. S. Public Health Service, but set it up as a visible card system, because of the large number of records involved. By means of this plan we can accurately tell at a glance, violations on any farm, or pasteurizing plant, and can then bring about rapid correction of unwholesome conditions due to laxity on the part of the producer or distributor. After setting up this record system and making reinspections, most of the farms and plants were willing to make the needed improvements. Every possible assistance was given to those who were inclined to coöperate, so that they could rapidly complete the remaining improvements.

Those who refused to make any corrections (a very small number) were excluded from the Chicago market.

The conditions on farms supplying cream-producing plants were originally not as satisfactory as on those in the milk producing area. It was found advisable to delay the grade A announcement on cream until August 1, 1936. This gave the farmers an opportunity to make necessary improvements without upsetting the market. By August 1, 1936, conditions on the farms had been brought up to a satisfactory level.

Our work in the control of milk and its products is rapidly nearing a stage of completion. This does not mean that we can sit back and that no further control is necessary. Continued inspections, reinspections, and constant vigilance are necessary if the grade A standard is to be maintained in the face of competition as keen as it is in the dairy industry. However, the groundwork has been laid on a firm foundation which will not be easily shaken.

One of the health officer's main weapons in milk control is proper pasteurization, and by that is meant proper pasteurization of every drop of the milk, including the foam. It means that every drop must be brought up to the temperature required and kept at that temperature for the required time.

With the methods of milk production now demanded, together with thorough and efficient pasteurization, we feel that our milk supply is safe and wholesome. A 16 per cent reduction in the infant mortality rate occurred in Chicago during 1935, and the general death rate remained at a low level. We feel that the improvement in the milk supply was at least a factor in this reduction.

The standard ordinance adopted was shown to be so flexible that when unusual situations were encountered, it was not necessary to amend the ordinance to cover them.

For example, it was thought advisable, in order to permit better inspection, to require that all milk and milk products sold in Chicago be pasteurized in Chicago and Cook County, and this could be required without amending the ordinance. Further, the elimination of all milk and milk products in bulk, except those used for manufacturing, was found advisable, and this too could be carried out without any change in the ordinance.

The cost of enforcement has not been high and we have reached the point where producers, distributors, and consumers are satisfied with the results. Many of the farmers and dealers who were in doubt as to the success of their business under the new ordinance are now in complete accord with the program.

We maintain that proper pasteurization is the front line defense against milk-borne disease, and it is a defense

which can never be allowed to waver or break down.

SUMMARY

1. The formulation and enforcement of an ordinance based on the standard milk ordinance of the U. S. Public Health Service, permitting only grade A milk and milk products, can be carried out in a large community.

2. A well trained, tactful, sympathetic group of inspectors will do much to make enforcement possible without producing antagonism on the part of dealers and distributors.

3. The grade A ordinance, since it brings improved products, will necessarily bring better returns for the effort expended.

4. The enforcement of any ordinance requires courageous health officers, backed up by a courageous mayor or other governing officer who is in sympathy with the purpose of the ordinance. This is nowhere more true than in regard to a milk ordinance.

5. Proper pasteurization is the first line of defense against milk-borne disease, and enforcement of all pasteurization requirements should be maintained at all times.

NOTE: A survey made by the U. S. Public Health Service in January, 1937, of the milk and milk products supply of Chicago showed a compliance rating of 97 per cent. This rating indicates the improvement made after the first survey as reported in this paper.

Medical Interest in Gas Masks

PRECAUTIONS for the defense of the country against air attacks are being rapidly made on a large scale. Those against gas attacks are particularly of medical interest. Masks of three main types are being made. The first is the standard army service type and can be worn for 48 hours without adjustment. This will enable men engaged in decontamination work, casualty evacuation or the control of any of the essential services in areas where the concentration is heavy and the hours of service long and continuous to carry on with perfect confidence. The construction of the mask is simple and it is guaranteed effective against any of the poison gases at present known to the government, excepting such vesicants as liquid mustard and lewisite, for which special protective clothing must be worn. The gas masks for the civilian population are of a different type and are designed to cause less resistance to breathing. For this and other reasons they can be worn without discomfort by elderly persons and by children over the age of 4 or 5 years. These masks are of two kinds, one good for from 6 to 8 hours, the other for 3 or 4 hours. The former mask, called the service type, is intended for those on special duties, such as stretcher bearing, point duty and shifts in factories and public works. The latter type, called the standard civilian mask, which is being produced in large quantities, gives sufficient protection for the civilian to take cover in a gas-proof shelter or to escape altogether from the danger zone. Students are being trained in the use of these masks as well as in anti-gas preparations in general.

The government is experimenting with three types of gas mask for small children. One is a portable cradle with a complete cover; the second is a special hood which completely envelops an ordinary perambulator; the third is a box in which a baby can sleep soundly.

One or all of these types may be adopted and issued to the public free. —London Letter, *J.A.M.A.*, March 27, 1937, p. 1130.

Practical Aspects of Public Mental Hygiene*

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KNOWING that all public health work, including public mental hygiene, depends so much on prevailing social and economic conditions, I could easily describe an ideal state in which mental health work would be unhampered and at a high level, but that would be impractical and not in keeping with present circumstances and with the solving of our problems at hand. When I was asked to speak before this meeting I was told that we were concerned with the necessity of incorporating definite practices through existing health agencies for the prevention of mental disease on a large scale.

Interested in mental hygiene, which, even in therapy, consists more of prevention than of real treatment, I have departed somewhat from psychiatry, which is inclined to deal more with the developed psychotic cases. Both from my clinical work here and abroad and from my own private practice I have learned the need of a public and social approach in all mental health matters. We cannot separate the individual, his mind, his adjustment, or lack of adjustment, from his environment, past and present. It is impossible, therefore, and entirely useless to attempt to prevent mental diseases from the public or personal standpoint without taking into consideration the station in life of a given person or a group, the family relationship, the upbringing, the occupation, the intellect and education, the race and nationality, the near and remote past. None of us has fallen from the moon; each one of us is a tiny ring in a long chain, and our reciprocal interdependence is infinite.

That is why I believe that the theoretical, generality or pioneering or infancy, or groping, trend of mental health must give way to a more mature period and that it is about time that the health agencies study and understand mental hygiene from a public viewpoint and take over its problems. They have been ignored too long. So far and on the whole public health men have failed to see their importance. Indeed these problems are just as momentous as those related to communicable diseases. It would certainly not be an exaggeration to maintain that mental diseases are sometimes even more contagious than the somatic ones.

In this country the mental hygiene movement was founded, at the dawn of this century, by a splendid man, who, after being hospitalized as a psychopath and having suffered much from mistreatment in institutions, managed to be cured and fight his way out of the insane asylum. He was helped in his

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work by psychiatrists. It was natural, then, that the mental hygiene movement should from its inception take the form of a struggle for the improvement of the hospitals for the insane and of the condition and treatment of the insane. He had had a great forerunner, Pinel, who, 100 years before, had taken, so to say, the part of the misunderstood and persecuted and tortured mental patient and, at the risk of being ridiculed, had given to the world a new idea about insanity.

The modern Frenchman, Dr. Toulouse, who started his work at about the same time as Clifford Beers here, and who is still active along the same lines in Paris, has had another conception of mental hygiene, which he properly calls mental prophylaxy, that is, prevention of mental diseases or rather conservation of mental health.

There is a need for a re-definition of mental hygiene. It is not psychiatry proper and should not be regarded as such. It is not therapy, but prevention of mental diseases or, like all hygiene, treatment before or almost before the disease appears or develops. It has nothing to do with hospitals for the insane or with the manner in which the psychopaths are treated there. It is not a fight for the amelioration of such institutions, although this may be a necessary work also.

Mental hygiene is a part of general hygiene and public mental hygiene is a public health work—in the same sense as general personal hygiene is not private medicine and public health is not hospital treatment.

Mental health or the prevention of mental disease is closer to general public health than to psychiatry and medicine, although it is helped by both. And no public health work is complete or rounded out if mental hygiene, understood in a new fashion, is disregarded and excluded.

What, then, can public and official health agencies do for the prevention of mental diseases? Very much—and large and heavy programs might be detailed. But here I only wish to indicate as briefly and sketchily as possible a few of the feasible works as instances of what health authorities might undertake. These examples are meant to stimulate further practical suggestions by other workers.

To begin with, it is necessary to be informed about the worthwhileness of mental hygiene. Without being deeply convinced about its importance nothing can be done or it would be done half-heartedly. Then we must become interested in what I call the *transition cases*, those between mental health and mental disease, where prevention is still possible. As there is no definite boundary between health and disease of the mind, the cases of people who have begun to be unadjusted are to be found everywhere. They are extremely abundant and many are amenable to improvement if approached in the right manner and about 50 per cent of them, I claim from past experience with them, are curable. This is a broad and beautiful and fertile field, of much greater significance than that of the advanced cases. It has been comparatively neglected because it has been in the care of psychiatrists who are the greatest of medical men, but who usually are not health minded, who do not have the public health point of view and are less interested in the transition cases than in the advanced ones.

I would advocate, therefore, preventive mental centers for adults conducted by health departments. I purposely would not call them clinics because they would really not correspond to what is commonly known by that word. They should be in the hands of special, or a novel type of, psychiatrists, who would be willing to work in a new spirit and

with a new vision, that of prevention and that of having in mind the place of the individual in his group and in society. The function would create the organ. Naturally, they would have to be sympathetic and entirely absorbed in the study of these cases and their environment. Of course, these centers would have to be connected with other public agencies whose object it is to solve or settle various individual problems, like courts, schools, parents' associations, trade unions, etc.

As child upbringing, sexual problems in all ages, but particularly in adolescence and youth, marital conflicts, industrial and economic difficulties, social frustrations, contribute enormously to mental maladjustment or constitute its worst causes, every public health agency should turn its attention to these matters.

There should be a mental hygienist in each elementary or secondary public school of some appreciable size, one for a few smaller schools and several mental hygienists employed in each of the larger schools.

All pupils should be examined mentally once during their entrance year, reëxamined if abnormalities are discovered, and a record kept about the findings. Irregularities should be discussed with the parents and the teachers. Behavior problems should be solved—or an attempt to solve them made—in coöperation with the parents, who would be instructed to report them. Very often it is their mistakes rather than those of the child that must be corrected and it is they who must be educated. Similar work is being done even now here and there, but insufficiently and not systematically.

The professional teachers' colleges should pay more attention to the study of child psychology and children's mental health. Health departments might be influential along such lines.

The child guidance clinics which were opened some years ago and functioned rather successfully in many places have been partly abandoned and partly shorn of their efficiency in the lean years. They should be revived, improved, and multiplied.

Easy courses in child upbringing for parents and future parents should be opened, preferably in public school buildings—always with a view of teaching possible mental disturbances and how to avoid conflicts which may lead to maladjustment.

Free marital consultation bureaus should be founded by health departments and all populated centers dotted with them. They should not be compulsory and should work in a rather friendly, sympathetic, and confidential way, trying to deal with the problems of young men and women who are willing to come for advice before marriage. These young people would be questioned, examined, and advised. As much as possible those originating from families in which insanity or feeblemindedness prevails would be discouraged from mating with those born into similarly handicapped families—both in their own interest and that of the community, it would be explained to them. The existence of such bureaus would also have a salutary and educative effect upon the people at large. At the same time, cases of gonorrhea, syphilis, and tuberculosis would be discovered and treated in marriage candidates. Other bad and evident mismating might be avoided. The effect of such bureaus would amount to a sort of modified eugenics. They would also give birth control instructions in appropriate cases and where that would be absolutely necessary in order to prevent possible mental misfits.

Several years ago I observed the work of the highly efficient and free Heiratsberatungsstellen of Vienna founded by

the late Professor Tandler and now all but wrecked. It was a worthwhile work that we should imitate and perfect.

As the various school authorities are rather reluctant to teach the necessary sexual facts to adolescents, public health agencies should undertake this work and open classes for young people where such instruction would be given. Dispelling the common fears and anxieties which are due to ignorance and misinformation, and lead to mental maladjustment and disorders, should be one of the greatest duties and one of the most useful functions of the health authorities. It would not only prevent mental troubles to a large extent, but it would prevent a good deal the spread of venereal diseases which are among the causes of mental disorders. It would also contribute toward a better life with fewer conflicts between married couples—and consequently again toward a diminution of mental disease.

All health departments have, sometimes on paper only, sections on industrial hygiene. They should not only become generally more efficient than they have been in the past, but should be interested in the mental aspects of the workers as well. Public health agencies should enlighten the employers, large and small, that it is to their own advantage that the workers be clear-minded, alert, and calm, in order to avoid accidents, to produce more and do better quality work. That is, of course, connected with the avoidance of overwork; with the distribution of the work so that the number of the unemployed be diminished; with more time for leisure for those employed, with improving working conditions all around. Physical over-fatigue goes hand in hand with mental over-fatigue, and economic insecurity is one of the frequent causes, or predisposing causes, of psychosis.

On the other hand, public health agencies should also keep in contact with the trade unions and gain their coöperation so that some mental hygiene teaching might be possible through them in relation to industrial conditions.

Although alcoholism has its roots in social life, an intensive educational campaign against it should be inaugurated and waged unceasingly, as alcohol is one of the purveyors of mental diseases. This is easier to do now than it was during the prohibition years when it might have been suspected as of political or selfish significance.

Educational instructions and campaigns should not be of the "Don't Spit on the Floor" type or in the form of an order to be obeyed blindly. No one coöperates with such orders, because they are not convincing. Reasons must be given and the interest of the people, nay, even their enthusiasm must be aroused.

Mental hygiene should penetrate all our public health work. The more of mental disease we prevent the greater our help to humanity.

Let us get rid of as much as we can of the blighting, ruining mind troubles so disseminated that there is hardly a family entirely devoid of them. They make our people miserable, helpless, and unhappy, and prepare further mental decay for the next generations. Let us get as close as possible to their causes. Let us free society from their strangle-hold and allow it to think more normally and rationally and work its way toward a greater happiness.

Observations Upon the Practical Value of the Complement-Fixation Test in the Diagnosis of Amebiasis*

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IN 1929, the writer described a technic for a complement-fixation test for the diagnosis of amebiasis and in later contributions (1930, 1931, 1933) detailed the results of the test in human infections, and, in conjunction with Kagy (1933), the results obtained with it in experimental infections with *Endamoeba histolytica* in dogs, results which were practically identical with those obtained in man.

Since the discovery by the writer that complement-fixation can be used as a diagnostic procedure in amebiasis, the occurrence of this phenomenon has been confirmed by numerous observers (Menendez, 1932; Spector, 1932; Heathman, 1932; Sherwood and Heathman, 1932; Tsuchiya, 1934; Weiss and Arnold, 1934; Meleney and Frye, 1935; and Stone, 1935), and the test has been employed as a routine by the writer and others in the diagnosis of infection with *E. histolytica* with excellent results. The writer has employed the test in diagnosis for a period of over 8 years, during which time over 1,500 individuals have been tested, and positive results have been obtained with it in approximately 18 per cent of those examined, the rather large percentage of positive reactions being due to the fact that more than three-quarters of those tested had either lived in highly endemic regions or were patients in hospital suffering from gastrointestinal disease. Of 1,000 individuals in whom the results of the complement-fixation test were checked by a stool examination, 175, or 17.5 per cent gave a positive reaction, while 825 individuals, or 82.5 per cent, gave a negative reaction. Of the 175 positive cases, *E. histolytica* was demonstrated in the stools in 157, or 89.7 per cent, while of the 825 individuals giving a negative reaction, only 12, or 1.4 per cent showed this parasite in their feces. Of 676 negative individuals with this test, no less than 220, or 32.5 per cent, were infected with other species of intestinal protozoa, and no less than 176, or 25.1 per cent, were infected with some other species of intestinal ameba.

The complement-fixation test, employing antigens made by the extraction of *E. histolytica* with alcohol is apparently as specific for amebiasis as is the Wassermann test for syphilis. It does not give false positive results with

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the blood serum of individuals infected with other species of intestinal amebae or flagellates, nor does it give a positive reaction in individuals suffering from other disease conditions, so far as is known. False positive reactions may occur with this test, as with every other serological procedure, but the percentage of such reactions must be very small and of little practical importance. A careful check of the feces in cases giving a positive reaction has almost invariably shown the presence of *E. histolytica* although sometimes repeated fecal examination must be made before the parasite is demonstrated. As important proof of the specificity of the test is the disappearance of the positive reaction after the elimination of the infection by treatment, the reaction usually disappearing within 2 weeks after the cessation of treatment if the infection has been eliminated.

The test gives positive results not only in cases of acute amebic dysentery but also in carriers of *E. histolytica*, with or without symptoms, and in cases of amebic abscess of the liver which have developed after the intestinal infection has spontaneously disappeared or been eliminated by treatment.

While the practical diagnostic value of the complement-fixation test for amebiasis is great, it should never be employed in preference to a microscopical examination of the feces for *E. histolytica*, when such an examination can be made by one experienced in the differentiation of this ameba from the other intestinal amebae of man. It has been the experience of the writer that repeated examinations of the feces will almost invariably result in the demonstration of this parasite, if it be present, except in those in whom an abscess of the liver or other organ has developed after the intestinal infection has disappeared, as sometimes happens; and repeated microscopical examinations of the feces should always be made before resort is had to the complement-fixation test in the diagnosis of amebiasis.

When expert microscopical examination of the stools for *E. histolytica* is impossible, the complement-fixation test will be found most useful in the diagnosis of "carriers" of the parasite; in suspected cases of amebic abscess of the liver or other organ; in acute or chronic dysentery of undetermined origin; in surveys to determine the incidence of infection with this parasite; and as a control measure in the treatment of amebic infection.

The Diagnosis of Carriers of E. histolytica—It is most fortunate that the complement-fixation test gives strong positive reactions in most "carriers" of *E. histolytica*, even in the absence of appreciable symptoms of the infection, and it has been the experience of the writer that a higher percentage of positive results has been obtained with this test in "carriers" than in those suffering from acute amebic dysentery. It has also been his experience, using antigens prepared from cultures of strains of *E. histolytica* producing both large and small cysts, that positive results are obtained with both in individuals whose feces show large or small cysts, contrary to the experience of Spector (1936) who states that she found that antigens prepared from cultures of a strain producing large cysts did not react with the blood serum of individuals infected with strains of the parasite producing small cysts. In our experience no difference has been found in the reactions produced by such antigens in individuals showing either large or small cysts of *E. histolytica*, either in man or experimental infections in dogs, nor have we been able to demonstrate any difference in the pathogenicity of such strains in experimental infections in kittens or dogs.

In the diagnosis of "carriers" and

mild symptomatic infections with *E. histolytica* the complement-fixation test is of great practical value, and routine tests made upon all patients entering hospital very frequently result positively in patients whose stools would never have been examined for this parasite owing to absence of suspicious symptoms or the presence of some other disease.

The Diagnosis of Amebic Abscess of the Liver—The complement-fixation test for amebiasis usually gives a positive reaction in cases of amebic abscess of the liver, and in this condition it is often of diagnostic value, as when the symptoms are vague or only suggestive, or the stools are negative for the parasite and a suspicious history and symptoms are present. It should be resorted to in suspicious cases even though the stools may prove negative upon expert examination, for sometimes abscess of the liver may occur after the intestinal infection has disappeared, either spontaneously or as the result of treatment. The writer has observed instances in which repeated stool examinations were negative for *E. histolytica* but in which the complement-fixation test was positive and the clinical symptoms suggestive of abscess of the liver. In these instances operation revealed the presence of an amebic abscess of the liver and *E. histolytica* was demonstrated in the scrapings from the wall of the abscess cavity.

In one instance the patient had been operated upon for empyema but as a routine complement-fixation test for amebiasis gave a positive reaction, it was thought that perhaps the empyema might have been caused by the rupture of an amebic abscess of the liver into the pleural cavity, and surgical exploration demonstrated the presence of a large abscess cavity in the upper lobe of the liver which communicated with the pleural cavity and from which the pus originated. In this case *E. histolytica* was demonstrated in the patient's stools after the positive complement-fixation test was reported, and it was also found in scrapings from the liver abscess wall. Such instances prove how desirable it is to employ this test in suspicious cases where the stool examination is negative.

The Diagnosis of Acute Amebic Dysentery—In acute amebic dysentery and in the acute exacerbations of chronic amebic dysentery the complement-fixation test is a valuable diagnostic agent. While the symptomatology of typical acute amebic dysentery is quite characteristic, many atypical cases occur, and it is believed that the statement that a correct diagnosis of this form of dysentery is impossible without the demonstration of *E. histolytica* in the stools will be concurred in by the vast majority of clinicians. Fortunately, the large, active trophozoites of this parasite are easily recognized by one well trained in intestinal parasitology, and the presence of such trophozoites containing red blood corpuscles is diagnostic of amebic dysentery. However, when stool examinations are impossible the complement-fixation test should be employed, for this test gives a positive reaction in at least 90 per cent of cases of amebic dysentery, in the writer's experience.

The possibility of a combined amebic and bacillary infection should not be forgotten for such combined infections are by no means rare, and a positive complement-fixation test for amebiasis, or even the demonstration in the stool of *E. histolytica,* does not always prove that the dysenteric symptoms are caused by the ameba. Much confusion has resulted in the description of the symptomatology of amebic and bacillary dysentery because of such combined infections and, if possible, every case of dysentery should be studied bacterio-

logically, even though *E. histolytica* be found in the stools.

The Diagnosis of Amebic Infection in Surveys—Under certain conditions the complement-fixation test for amebiasis may be of service in surveys to determine the incidence of occurrence of this parasite, but the test should not be used for this purpose if it be possible to examine the feces properly. It may sometimes happen that trained personnel for this purpose is not available where surveys are desired, and, if not, it would be practicable to collect blood serum and send it to a laboratory for the complement-fixation test. So far as the writer knows, the test has never been used in surveys but, under the conditions mentioned, it should prove of practical value in epidemiological studies.

The Control of the Results of Treatment—Not the least valuable feature of this test is its possible use in the control of the results of treatment of amebiasis with various drugs. A positive reaction with this test becomes negative after the elimination of infection with *E. histolytica*, usually within 2 weeks after the disappearance of the amebae from the stools. If the reaction remains positive, even though the amebae have disappeared from the feces, it has been found that the organisms again appear in the stools within variable periods, so that the continuance of a positive reaction indicates that the infection is still present although the amebae cannot be demonstrated in the feces. In fact, in some cases which became negative both for the parasite and serologically, a return of a positive reaction has been noted before the stools again became positive for the ameba. A permanent negative reaction in individuals positive before treatment is conclusive as to the elimination of the parasite, in our experience. On the contrary, a continued positive complement-fixation test after treatment, even though no amebae are demonstrable in the stools, indicates that further treatment is necessary in order to eliminate the infection.

In conclusion, a word of warning regarding the interpretation of a positive reaction with the complement-fixation test is necessary, for while such a reaction indicates the presence of an infection with *E. histolytica* it does not demonstrate that the clinical condition present is necessarily caused by this parasite, and it should not lead one to neglect the most careful study of the case for other conditions that might produce a similar clinical picture. It should always be remembered that *E. histolytica* is a common parasite of man, occurring in approximately from 8 to 10 per cent of our population, and that because it is so common it will certainly be encountered in many patients suffering from disease conditions simulating in symptomatology infections with this parasite.

Some authorities have apparently blamed the finding of *E. histolytica* in the stools, or a positive reaction with the complement-fixation test, for mistakes in diagnosis of serious nature, in that the clinician neglected to examine his patient for other possible disease conditions, being content to accept the diagnosis of amebiasis as an explanation of the symptomatology present. If such unfortunate diagnostic mistakes have occurred, and they undoubtedly have, it is not the fault of the positive stool examination or the positive complement-fixation reaction that the mistake occurred, but it is the fault of the clinician who failed to recognize the fact that any infection with *E. histolytica* may be combined with other infections or disease processes. If the diagnosis of malignant disease of the intestine is missed because the complement-fixation test for amebiasis is positive or *E. his-*

tolytica is found in the stools, it is not the fault of the test or of the stool examination, but of the attending physician for placing too much faith in laboratory results, and failing to recognize the fact that an amebic infection may be coincident with malignant disease of the intestine and that the symptomatology of both conditions are frequently similar.

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Standards

"Two of the recommendations adopted by the Inter-Governmental Conference call for special attention, namely, that which advocates that the use of the international standards 'should be made effective by the competent authorities of all countries,' and that which relates to the setting up of national centres to hold and distribute the international standards, since these were the two resolutions that were communicated to all governments by the Secretary-General in February, 1936.

"Replies so far received indicate that 41 countries have adopted or are about to adopt the international standards recommended by the Permanent Commission on Biological Standardisation and that 31 Governments have created or are about to create national centres. . . .

"It would appear that for some drugs — digitalis, pituitary extract, arsphenamine — no insuperable difficulties will be encountered in preparing national standards. This is not the case, however, for the serological standards, and it is to be expected that the Copenhagen Institute will, as in the past, have to supply international standard sera to the great majority of national centres, whose business it will be to preserve these under the requisite conditions of temperature, and distribute them in their own countries to suitable applicants." — Twenty-fifth Session of the Health Committee, League of Nations, May 4, 1937.

Amebiasis in Chicago*

December, 1933, to June, 1936

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IN connection with the study of amebic dysentery in Chicago we have sought to ascertain the varying prevalence of *Endamoeba histolytica* infestations at different periods and in varying groups of the general population. This survey was independent of the examination of groups of persons with known exposure at epidemic foci. Epidemiological information was not collected from each individual examined, but the groups were so selected that but few would be expected to visit the institutions involved in the epidemic. Histories of 34 active cases treated at the Billings Hospital between 1933 and 1936 were studied and only 12 patients stated that they had eaten, lived, or worked at the epidemic foci. Within the limits imposed by the difficulty of obtaining stool specimens, we have endeavored to collect material representative of the general population.

For comparative purposes Table I summarizes the observations concerning the prevalence of *E. histolytica* infestations in America and representative findings in other lands. There is a wide variation in findings (Table I) even by the same workers at close intervals; as in the 3 studies in Tennessee by Meleney and his associates. It is to be noted that in the United States the proportion of observed positive findings of *E. histolytica* ranged from 0.2 per cent to 38 per cent. In foreign countries as high as 72.7 per cent have been found to harbor *E. histolytica*.

METHODS

The best sources from which material for examination could be obtained continuously were the university clinics, the Billings Hospital, and the Lying-In Prenatal Clinic. During the time of this study 5,630 persons were examined from these sources who came from various parts of Chicago and represent persons of modest means. Throughout the study those examined came from the same general population. The clinics which coöperated in sending material included the general medical, gastrointestinal, ophthalmology, otolaryngology, surgery, urology, and dermatology. A closely similar proportion of specimens came from these clinics. A much smaller number came from private and semi-private patients in the general medical wards. The practice was to include the collection of a stool as a part of the general examination. The specimens were usually passed in

* Read before the Laboratory Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

TABLE I

Results of Surveys of Infestations with E. histolytica

Observer		People Examined	Date	No. of Exams. per Person	No. Examined	Per cent of Positives
A. *American*						
Andrew and Paulson	(1)	Patients at Gastrointestinal Clinic, Baltimore	1931	...	522	0.2
Summerlin	(2)	Private patients, San Diego, Calif.	1934	Children	513	0.4
				Adults	1,339	2.1
Boeck and Stiles	(3)	Am. soldiers with overseas service	1923	1.6	4,536	2.8
" " "		Persons with undetermined status	1923	1.6	362	3.0
Meleney	(4)	Patients in Vanderbilt Hosp., Jan., 1930–June, 1932 (rural and urban from middle Tenn.)	1933	...	2,112	3.0
Boeck and Stiles	(3)	Am. soldiers with service at home	1923	1.6	2,584	3.5
Weinrich, Stabler, and Arnett	(5)	University of Penn. Students	1934	1	1,060	4.1
Giffin	(6)	Various patients at Mayo Clinic	1913	...	1,700	4.5
Naus and Salinger	(7)	Food handlers, New York City	1935	1	222	5.4
Wight	(8)	Ex-soldiers, Veterans Hosp., Calif.	1926	2.4	1,341	6.8
Magath and Ward	(9)	Various patients at Mayo Clinic	1928	...	457	7.9
Boeck and Stiles	(5)	Persons with no military status	1933	1.6	1,547	8.3
Johnston, David, & Reed	(10)	Prisoners, San Quentin Prison, Calif.	1933	...	1,000	9.2
Kofoid, Kornhauser, and Plate	(11)	Am. soldiers who served in France	1919	1	1,200	10.8
Craig	(12)	Medical officers in Washington, D. C.	1932	...	184	13.0
Faust	(13)	People in New Orleans	1931	...	1,100	13.7
Sistrunk	(14)	Various patients at Mayo Clinic	1911	...	145	17.2
Meleney	(15)	Persons in rural Tennessee	1930	...	4,987	17.3
Faust	(16)	Persons in Wise County, Va.	1930	...	460	20.0
Sanford	(17)	Various patients at Mayo Clinic	1916	...	5,000	22.7
Milam and Meleney	(18)	Small rural community in Tenn.	1931	...	374	38.0
B. *Foreign*						
Faust and Wassel	(19)	House servants of Europeans, Wachung, China	1921	...	40	2.5
York, Carter, MacKinnon, Mathews, and Smith	(20)	English persons—never out of England	1917	...	344	2.9
Wenyon and O'Connor	(21)	British West Indian cooks in Alexandria	1917	...	48	4.1
Smith and Matthews	(22)	Cases with history of dysentery, hosp.—Liverpool	1917–1919	2–6	42	7.1
" " "		Non-dysenteric patients in hosp.—Liverpool	1917–1919	...	200	7.5
" " "		Patients with no history of dysentery, hosp.—Liverpool	1917–1919	...	158	7.6
" " "		Patients who had been to tropics and subtropics	1917–1919	...	142	7.7
Gaiskaga	(23)	Adijan—workers and students	1933	...	1,185	9.9
Carter, MacKinnon, Mathews, and Smith	(24)	Dysenteric convalescents, Liverpool	1917	...	910	10.3
Wenyon	(25)	British soldiers from Mediterranean patients in hospital	1916	...	556	10.8
Faust and Wassel	(19)	Coolies—Wachung, China	1921	...	46	10.8
Wenyon and O'Connor	(21)	Native cooks in army bakery, Alexandria	1917	...	87	11.5
McAdam	(26)	Non-dysenteric persons in India	1919	...	351	13.0
Faust	(27)	Patients in North China	1929	...	13,617	15.3
Kessel and Svensson	(28)	Europeans in Peking	1924	...	221	16.5
Epstein	(29)	Armenia	1933	1	?	17.7
McAdam	(26)	Dysentery convalescents—India	1919	...	385	17.8
Gaiskaga	(23)	Adijan—patients with Int. symptoms	1933	...	586	24.9
Epstein	(29)	Persons in Leningrad	1933	1	1,404	25.3
"		Turkestan	1933	1	1,064	25.4
Faust and Wassel	(19)	Europeans in Wachung, China	1921	...	98	27.5
Kessel and Svensson	(28)	Chinese in Peking, China	1924	...	816	29.5
Epstein	(29)	Georgia	1933	1	570	32.3
"		Azerbaijan	1933	...	1,146	32.5
Gaiskaga	(23)	Adijan—factory workers	1933	...	463	39.2
Faust and Wassel	(19)	Patients in hosp.—Wachung, China	1921	...	57	50.9
Epstein	(29)	Kola Peninsula (not a case of dysentery)	1933	...	900	60.6
Faust	(13)	People in Panama	1931	...	2,000	72.7

TABLE II

Incidence of Amebiasis—Patients at Billings Hospital and University of Chicago Clinics, 1934 to 1936

Year	Month	No. of Persons Examined	E. Histolytica: Large T.± (P. & C.)	Large P.C.	Large C.	Small T.P.C.	Small P.C.	Small C.	Large and Small T.P.C.	Large and Small P.C.	Large and Small C.
1934	Jan. to June	737	12	1	5	5	38	198	0	3	6
1934	July to Dec.	892	10	0	5	3	36	100	1	3	9
1935	Jan. to June	1,054	2	1	13	1	5	120	0	1	7
1935	July to Dec.	911	2	1	13	1	5	77	0	1	3
1936	Jan. to June	815	3	0	10	1	3	19	0	0	2

T. = Trophozoites
P. = Precysts
C. = Cysts

the clinic or hospital, but occasionally were collected at home and brought to the laboratory promptly.

From sources outside of the hospital approximately the same number of specimens was obtained, as shown in Table IV. It was not possible to continue obtaining specimens from the same source for prolonged periods. This group includes a disproportionately large number of unemployed and of food handlers.

The fresh specimens were examined by direct smears, using warm water or saline and iodine solution (5 per cent aqueous solution of potassium iodide saturated with iodine and diluted with equal parts of distilled water). As many preparations were made as was necessary but never less than 4; 2 with water or saline and 2 with iodine. Using a No. 10 ocular, the smears were first examined with the low power, then with the high dry. The oil immersion was rarely used. At first cultures were made routinely, but later only when deemed necessary as an additional aid in diagnosis. Most of the persons were examined only once. In case of doubt repeated specimens were examined.

The small and large races of *E. histolytica* were classified morphologically according to the size of the cysts. The small variety were usually 6 to 9 μ in diameter although as small as 5 and as large as 12 μ in diameter were encountered. The large variety ranged from about 13 to 18 μ in diameter. The presence of red blood cells in the trophozoites indicated the presence of the large variety. Earlier studies (31 and 32) have shown that when cultured with ease with the production of a luxuriant growth the organism is usually found to be a large cyst producer. Other differential features disclosed elsewhere were also used in the identification of these races of *E. histolytica*. (31 and 32).

FINDINGS

Prior to mid-December, 1933, the small variety *E. histolytica* cysts (5 μ or less to 12 μ) had not been encountered in Chicago. From that date they began to assume a prominent rôle in the parasitology of the intestinal tract among the local residents. The striking feature in the past 2½ years has been the appearance of these forms and their progressive disappearance. During the first 6 months of 1934 the small variety *E. histolytica* was found in 33.9 per cent of examinations, while through a progressive decrease in only 3.0 per cent in 1936 (see Tables II and III).

TABLE III

Amebiasis at University of Chicago Clinics, Billings Hospital, and Lying-In Prenatal Clinic

University of Chicago Clinics and Billings Hospital

Month and Year	No. of New Persons Exam.	No. +	% +	Large T.P.C.	Large T.P.	Large P.C.	Large T.	Large C.	Small T.P.C.	Small T.P.	Small P.C.	Small P.	Small C.	Large and Small T.P.C.	Large and Small P.C.	Large and Small C.
Dec., 1933	24	5	20.8	1	..	2	..	..	..	*	..	*	2	..	..	..
Jan., 1934	53	19	35.8	..	1	1	1	..	..	..	5	..	10	..	..	1
Feb.	104	40	38.4	..	2	..	1	..	..	..	4	..	32	..	..	1
March	169	49	28.9	..	1	..	1	..	..	1	5	..	41	..	..	..
April	100	41	40.0	..	..	..	..	3	2	1	5	1	26	..	1	2
May	124	53	42.7	1	2	..	..	1	..	..	8	2	37	..	..	2
June	187	66	35.4	..	..	..	2	1	1	..	8	..	52	..	2	..
July	160	47	29.3	..	2	..	..	1	1	..	15	..	25	..	..	3
Aug.	147	35	23.8	1	1	..	..	..	..	..	7	1	24	..	1	..
Sept.	189	19	10.0	1	..	..	1	1	..	..	2	..	12	1	..	1
Oct.	156	23	14.7	..	..	..	..	1	..	..	2	..	17	..	1	2
Nov.	126	25	19.8	1	1	..	1	..	2	..	6	..	12	..	1	1
Dec.	114	18	15.7	..	1	..	..	2	..	..	2	1	10	..	..	2
Jan., 1935	166	31	18.6	..	..	..	..	2	..	..	2	..	25	..	1	1
Feb.	153	32	20.9	..	..	..	..	2	..	..	1	..	27	..	..	2
March	215	27	13.0	1	..	..	..	3	1	..	1	..	20	..	..	2
April	163	21	12.8	..	..	1	..	3	..	..	1	..	16	..	..	..
May	183	21	11.4	..	..	..	..	2	..	..	..	..	18	..	..	1
June	174	17	9.7	..	1	..	..	1	..	..	..	..	14	..	..	1
July	163	25	15.3	..	1	1	..	3	1	..	1	1	16	..	1	..
Aug.	84	15	17.8	..	1	..	..	1	..	..	1	..	11	..	..	1
Sept.	152	16	10.5	..	..	..	..	1	..	..	1	..	13	..	..	1
Oct.	180	20	11.1	..	..	..	..	4	..	..	1	..	14	..	..	1
Nov.	181	19	10.4	..	..	..	..	3	..	..	..	..	16	..	..	..
Dec.	151	8	5.2	..	..	..	..	1	..	..	..	..	7	..	..	..
Jan., 1936	136	5	3.6	..	..	..	..	1	..	..	1	..	2	..	..	1
Feb.	123	3	2.4	..	..	..	..	..	..	..	2	..	1	..	..	..
March	135	7	5.1	..	..	..	..	2	..	..	..	..	5	..	..	..
April	129	8	6.2	..	..	..	..	1	..	..	..	..	7	..	..	..
May	135	6	4.4	2	..	..	..	1	1	..	..	..	2	..	..	..
June	157	9	5.7	1	..	..	..	5	..	..	..	..	2	..	..	1
Total	4,433	730														

Lying-In Prenatal Clinic

Month and Year	No. of New Persons Exam.	No. +	% +	Large T.P.	Large P.C.	Large C.	Small P.C.	Small C.	Large and Small Cysts
Jan., 1935	..	..		..	..	..	..	..	..
Feb.	4	..		..	..	..	..	..	..
March	65	7	10.7	..	..	1	..	5	1
April	45	7	15.5	..	..	2	..	5	..
May	48	6	12.5	..	..	..	..	6	..
June	39	6	15.3	..	..	..	..	5	1
July	37	2	5.4	1	..	..	..	1	..
Aug.	52	9	17.3	..	1	..	2	6	..
Sept.	73	8	10.9	..	..	1	1	5	1
Oct.	122	16	13.1	..	..	1	..	10	5
Nov.	104	6	5.7	..	..	1	..	5	..
Dec.	43	4	9.3	..	..	..	..	3	1
Jan., 1936	108	12	11.1	..	..	2	..	10	..
Feb.	90	7	7.7	..	..	2	..	5	..
March	140	15	10.7	..	..	4	..	9	2
April	81	1	1.2	..	..	..	..	1	..
May	85	8	9.4	..	..	4	..	3	1
June	61	4	6.5	..	..	1	..	3	..
Total	1,197	118							

T. = Trophozoites
P. = Precysts
C. = Cysts

L. = Large variety
S. = Small variety

* Only 1 specimen was obtained before treatment. Clinically and culturally they fall here rather than with the large variety.

TABLE IV

Amebiasis in Chicago, 1934–1936

Date of Exam.		Persons Examined	Adults	Children	No. Examined	No. +	% +	*E. histolytica*						
								Large			Small		Large and Small	
Year	Month							T.	P.C.	C.	P.C.	C.	P.C.	C.
1934	Mar. and Apr.	Employees at hospital X	X	..	88	10	11.3	..	..	1	..	8	1	..
1934	June and July	Kitchen help—Cook County Hosp.	X	..	93	8	8.3	..	..	2	1	5	..	..
1934	Feb. to Aug.	Food handlers (mainly unemployed waiters)	X	..	572	104	18.1	5	34	41	3	18	1	2
1934–35	Apr., 1934, to July, 1935	Food handlers, new applicants (S. Sh. C. C.)	X	..	248	44	17.7	1	..	1	8	31	..	3
1934	July	Firemen (who were not at stock yards fire)	X	..	167	30	17.96	..	..	3	3	22	2	..
1935	Mar. to July	University of Chicago medical students	X	..	78	8	10.2	..	..	.	..	6	..	2
1935	Apr.	Men from the Water Purification Division	X	..	39	8	20.5	..	..	3	..	5	..	..
1936	Oct.	Men from the Water Purification Division	X	..	58	3	5.1	..	..	1	..	2	..	..
1935–36	Feb., 1935, to June, 1936	Health Service, U. of Chicago Clinics	X	..	112	10	8.9	..	..	3	..	7	..	..
1935	Jan. to Oct.	Down-town dept. store (largely food handlers)	X	..	572	64	11.19	..	..	15	..	45	..	4
1935–36	Nov., 1935, to Mar., 1936	Factory along Chicago River	X	..	129	12	9.3	..	..	4	..	7	..	1
1934–35	Sept., 1934, to Jan., 1935	Transient shelters (317 S. Throop St., etc.)	X	..	546	121	22.1	..	..	21	1	94	..	5
1934	Nov.	Transient shelter (4949 Indiana Ave.) (mostly colored)	X	..	240	51	21.2	..	..	7	..	38	..	6
1934	Oct.	Cathedral shelter (older men)	X	..	56	11	19.6	..	..	3	..	8	..	..
1934	Nov.	Transient shelter for older men (563 W. Randolph St.)	X	..	30	2	6.6	..	..	1	..	1	..	..
1934–35	Dec., 1934, to Jan., 1935	Service Bureau for Men (1808 W. Harrison St.)	X	..	279	63	22.5	..	..	7	3	45	..	8
1936	Apr. to June	Shelters at 1808 W. Harrison St. and 1426 S. Newberry Ave.	X	..	151	6	3.97	..	..	3	..	3	..	..
					3,458	555		6	34	116	19	345	4	31
1936	Apr. to June	Country Home for Convalescent Children	..	X	157	8	5.5	..	..	4	..	4	..	..
1934	May to Sept.	Cook County Hospital—*Children*	..	X	514	25	4.8	..	1	3	..	19	..	2
1934	Dec.	Children's Memorial Hospital and Home for Crippled Children	..	X	204	9	4.4	..	..	1	..	7	..	1
1936	Feb.	Home for Jewish Orphans (mainly children, few adults)	X	X	145	4	2.7	..	..	2*	..	2†	..	..
		Mainly children			1,020	46	...	..	1	10	..	32	..	3
		Adults			3,458	555	...	6	34	116	19	345	4	31
		Total			4,478	601	...	6	35	126	19	377	4	34

* Both adult employees
† 10 and 16 years of age

T. = Trophozoites
P. = Precysts
C. = Cysts

There has also been a marked variation in the frequency with which the trophozoites and precysts have been encountered. In 1934, for both large and small varieties, these were frequent. In 1935 and 1936 they were relatively infrequent. The incidence of these forms decreased more rapidly than did the incidence of the cyst carriers. The proportion found to harbor the large variety *E. histolytica* cysts has shown no significant change.

When the small variety *E. histolytica* cysts first made their appearance they were typical in morphology (round or oval), varying from about 5 to 12 μ in diameter. They were widely distributed and were usually numerous in positive stools. As their incidence diminished, the number per positive stool diminished and pleomorphic forms appeared until now it is almost impossible to find a good heavily infected specimen.

Data presented in Table IV seem to substantiate the series of observations on patients from the University of Chicago Clinics and Billings Hospital. The greater constancy of proportion of the large cyst carriers as compared with the small cyst carriers is evident.

DISCUSSION

The observations here presented give further evidence of the distinctive features of these varities of *E. histolytica*. In the general population from 1 to 3 per cent have been found to harbor the large variety *E. histolytica*. The relative constancy of the proportion of these carriers suggests that either those who harbor the large cysts tend to be chronic carriers or that new infestations equal in number the spontaneous cessation of the carrier state.

It appears that for some undetermined cause there was a widespread infestation with *E. histolytica* of the small cyst variety which began the latter part of December, 1933. During 1934 the general population was heavily infested, and few of them received medication. The carrier state seems to have discontinued spontaneously. Whether the residents of Chicago will gradually again become free of infestation with the small variety of *E. histolytica* is a matter to be determined by further observations.

CONCLUSIONS

1. There was an epidemic of the small variety *E. histolytica* in Chicago beginning the latter part of December, 1933, reaching a climax in the spring and summer of 1934, and which declined to almost extinction by the summer of 1936.

2. When they first appeared the small variety were numerous and typical morphologically; later they diminished in number and pleomorphic forms appeared, and finally became exceedingly scarce.

3. The large variety, on the other hand, remained typical morphologically and did not undergo such a decrease in incidence.

4. There does not seem to be any direct relation between the number of carriers and the incidence of acute amebic dysentery. This is based on results in Table II, column marked "Large," and Table III, results at University of Chicago and Billings Hospital.

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Infant Mortality in New York City*

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ALONG with other cities in the United States and abroad, New York City was experiencing a declining infant death rate as a by-product of the increase of medical knowledge and the general improvement in sanitary conditions long before a specific program to combat infant mortality was inaugurated in the city. Bolduan and Weiner [1] have shown that the infant death rate in New York City has been declining since 1870.

In the past 20 years, despite yearly fluctuations, there has been a continued downward trend in the infant mortality rate for New York City, the rates declining from 93 per 1,000 live births in 1916 to 48 in 1935. The decline is most readily appreciated from the curve in Figure I.

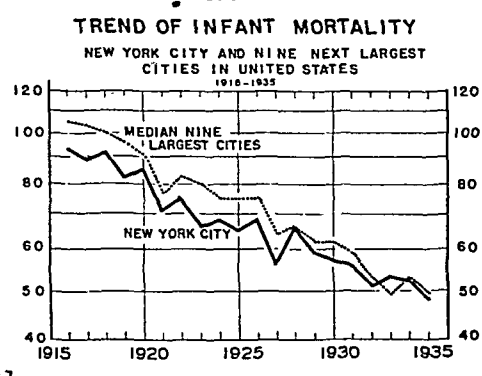
For purposes of comparison, a curve of the medians of the infant mortality rates of the other 9 largest cities in the United States is also shown. In terms of the 20 year mean, the infant mortality rate for the city as a whole declined at a rate of 3.4 per cent per annum over this period. Unfortunately, the detailed data for the other 9 cities were not available for the entire 20 years covered by this review, and the mathematical value of the trend cannot be calculated. It appears, however, that the rate of decline in this group of cities has been greater than in New York, especially in recent years, and the question might well be raised whether New York City is not approaching a plateau in the infant mortality rate which will require newly directed efforts in the child hygiene program.

DECLINE IN INFANT MORTALITY BY CAUSES

The general trend of the infant mortality from certain selected groups of causes is shown in Figure II (also see table).

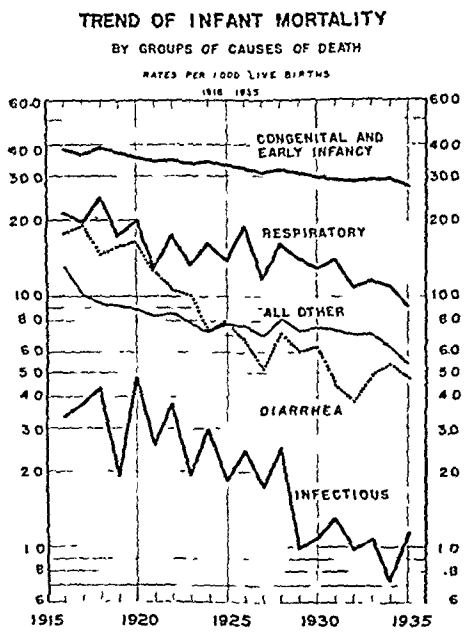
This chart shows clearly that the greatest progress has been made in precisely those fields where our knowledge has been greatest. Diarrheal deaths have declined at the average annual rate of 8.3 per cent of their 20 year mean, while the mortality from preventable diseases — largely measles,

FIGURE I



* Read before the Child Hygiene Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936.

FIGURE II



scarlet fever, and whooping cough—has gone down at the rate of 7.6 per cent per annum. The decline in the infant death rate from respiratory diseases, 3.7 per cent per annum, was only slightly greater than that of the total infant mortality rate, while that for the group of conditions classed as Diseases of Early Infancy—prematurity, congenital malformations and injuries at birth—has lagged far behind the decline of the total rate, having decreased at the rate of only 1.8 per cent per annum. Infant mortality from other causes—syphilis, simple meningitis, diseases of the ear, hernia, and accidents—declined at the rate of 2.9 per cent per annum, also lagging behind the decline in the total rate.

AGE AS A FACTOR

From the facts presented in Figure II, it is logical to conclude that the great reduction in the infant death rate has been largely restricted to infants who have survived the first weeks, and relatively little has been done to improve the lot of the infant at birth. The accuracy of this conclusion is brought out in Figure III, which shows that while the death rate in the age group, 1 month to 12 months, inclusive, declined 68 per cent (from 63.8 in 1916 to 20.7 in 1935), the mortality of infants in the first month of life declined only 21 per cent (from 36.8 to 29.1). The total death rate under 1 year declined approximately 50 per cent during the same time. It is the reduction of the neonatal mortality that constitutes the challenge for the future.

TABLE I

City of New York
*Reduction in Infant Mortality * By Groups of Causes*
1916 to 1935

Cause	Average Death Rate *	Annual Average Change	Annual Change Per cent of Mean
All Causes	67.5	—2.30	—3.4
Diarrhea and Enteritis	9.3	—0.77	—8.3
Communicable Diseases	2.2	—0.17	—7.6
Respiratory Diseases	15.3	—0.56	—3.7
Congenital Causes	32.6	—0.57	—1.8
Other Causes	8.1	—0.23	—2.9

* Deaths under 1 year of age per 1,000 live births

Statistical Division
Bureau of Records
Department of Health
City of New York

THE RACIAL FACTOR

The infant mortality rate of negroes in New York City is nearly double that

FIGURE III

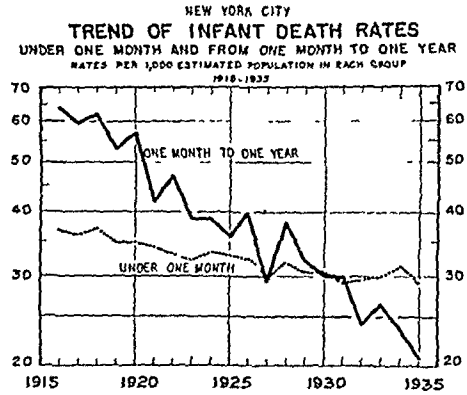
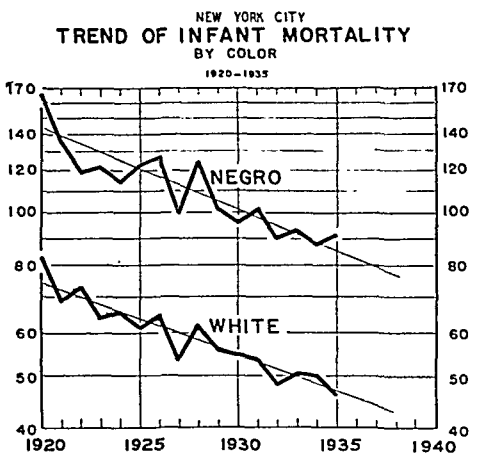


FIGURE IV



of the whites (Figure IV). The negro population has increased materially in the last 10 years, though the proportion is still relatively so small as to increase the general city rate only 2 or 3 points. The decline in the rate among negroes during the 16 years, 1920 to 1935, has equalled the decline in the white rate. The negro rate declined 3.4 per annum; the white 3.3 per cent.

PROBABLE CHIEF CAUSES FOR THE REDUCTION

Many factors have contributed to the decline in infant mortality. In most large cities there has been established a system of stations for the care of well babies under both official and voluntary auspices. The regular health supervision of the infant and the education of the mother in the care and feeding of the baby has had a large effect. The safeguarding of milk supplies and the control of communicable diseases, together with the general health education of the public have played their part in saving infant lives. New York City has enjoyed benefits from all of these measures. In addition, special mention may be made of two favorable factors of more recent date:

1. The character of the population is tending toward stabilization. The United States Immigration Quota Laws of 1922 and 1929 have rigidly controlled the number of aliens entering the country, and have set up individual requirements of literacy, intelligence, and health. The effect has been to reduce the numbers of certain groups with high infant mortality rates and presumably improve the caliber, from a health standpoint, of those that have come.

2. There has been during the depression an increased supervision of the health of the low-income group. Heretofore, if a man earned $16 per week, the spending of it was largely his own affair. Now a large proportion of the clientele of the department's Baby Health Stations is "on relief." The relief agencies in New York City have given splendid coöperation in matters pertaining to the public health, and have been eager to secure accurate information to help them in guiding their clients. They have requested frequent meetings for instruction of their personnel in matters of infant health, tuberculosis, venereal disease prevention and treatment, and other public health problems. They have urged health supervision for their clients and have referred them to suitable facilities. Probably never before has there been such widespread supervision of the health of low-income groups.

INFANT HYGIENE PROGRAM OF THE IMMEDIATE FUTURE

In the face of the facts outlined above, what are the most promising lines of attack in the immediate future? The usual child hygiene program is not so constituted as to affect to any marked degree the neonatal causes of death. New York City has already undertaken several steps designed to meet the situation more appropriately.

The Development of Health Districts—The plan of organizing the city into 30 health districts, each in charge of a health officer, was put into effect in 1934. The object was to bring health work closer to the people and to make possible a more intimate understanding of the specific needs of each district. Seven districts were organized in 1934, and 8 more will be organized early in 1937. By a temporary combination of the remaining districts it is planned to have the entire city administered under the decentralized plan before the end of 1937. Under this arrangement the child hygiene program will be expanded and conducted more intensively. In the districts first organized the response of mothers has been reflected in the increased registration at the baby health conferences. Registration of infants under 1 month of age increased from 64 per 1,000 live births in 1931 to 99 in 1935.

The Advisory Obstetrical Council—Although the Health Department is directly responsible through its own prenatal clinics for only a small proportion of the prenatal cases throughout the city—about 5 per cent—and does not participate in any delivery program, it must, nevertheless, recognize its responsibility of leadership to this important work. To this end the Commissioner appointed, in 1934, an Advisory Obstetrical Council of 18 leading obstetricians to study this problem thoroughly and present concrete suggestions and recommendations for correcting the situation. For many years, indigent and low income patients have been urged to register with a hospital and go there for confinement. That this education has been effective is shown by the fact that during the past 5 years an average of 78 per cent of all births in New York City have occurred in hospitals. If this program is to be successful, adequate hospital facilities must be easily available.

The Advisory Obstetrical Council believes that there must be a much closer relationship between the prenatal clinics and the hospital obstetrical services. One recommendation is that every physician in a prenatal clinic must have affiliation with the obstetrical staff of a recognized hospital. As new staff appointments are made, this recommendation is being followed.

The question of relationship between the prenatal care of the women in the indigent and low income groups and the delivery service for these women is complex and is being further studied. A moot question is whether prenatal clinics should be invariably attached to obstetrical services of hospitals. This would undoubtedly raise the standard of work and facilitate care of emergencies. A practical difficulty is that hospitals are frequently not so located geographically as to be easily accessible for prenatal clinics, and hospitals, as a rule, do not conduct outside substations. The exchange of records between the prenatal clinic and the hospital has been advocated and tried to some extent. Because experience shows that women often go to different hospitals from the ones where they registered, the suggestion has been made that the prenatal clinic give to the woman herself a record form containing all data that might be helpful to the hospital and rely upon her to present this record to the hospital upon admission. This plan has been held in abeyance pending the final report and recommendations of the Advisory Obstetrical Council.

Increased Emphasis on the Diagnosis and Treatment of Syphilis in Pregnancy—As one of the measures aimed at reducing neonatal deaths, renewed emphasis has been placed on the early diagnosis and treatment of syphilis in

the pregnant woman. Wassermann tests are taken on all women attending departmental prenatal clinics, and facilities are now available for prompt and continued treatment of every woman found with syphilis. At the instigation of the Health Department, other prenatal clinics where formerly a test was made only " when indicated," have now made it routine. Arsenicals are now distributed free by the Health Department to any physician in the city for cases of infectious syphilis, congenital syphilis, and syphilis in pregnant women. Voluntary hospitals treating free cases may also obtain free drugs for these types of cases. Departmental staff and allied health workers, including practising physicians and midwives, have had the necessity for the early diagnosis and treatment of syphilis in pregnant women forcibly and repeatedly brought to their attention through varied methods of health education.

Facilities for the Care of Premature Infants—In 1935, out of a total of nearly 4,800 deaths under 1 year of age, approximately 1,500, or about 30 per cent, were due to premature births. This offers a direct challenge to all workers in the field of maternal and infant hygiene.

The education of all women to secure early, adequate, and continuous prenatal care is being stressed. The expectant mother is given definite information about the possibility of premature birth and what to do if it occurs. Every pregnant woman and a responsible member of her household should be taught that a premature baby needs special care, and where and how the necessary facilities may be quickly obtained. Practising physicians should also be notified of all facilities for premature infants and how to obtain their use. A recent survey shows that 84 hospitals have a total of over 200 incubators, warm beds, and bassinets, and 5 special rooms for the care of premature infants. Estimates place the use of these facilities at only from 50 to 75 per cent of their capacity. This is probably due to lack of information of the public and of the medical profession as to their existence and availability, rather than to the lack of need for them. Bundesen's [2] program for the care of premature infants initiated in Chicago in 1935 has shown that excellent results may be obtained through such leadership by the official health agency.

In addition to keeping the premature baby warm enough from the time of birth, preventing infections, and providing medical and nursing care especially adapted to this condition, the supplying of proper food is essential. New York City is fortunate in the provision for obtaining breast milk through the Mothers' Milk Bureau operated by the Children's Welfare Federation. Milk is collected from healthy mothers nursing their own healthy babies and, after pasteurization, is dispensed on doctors' prescriptions for premature and very ill infants. A new process makes it possible to preserve this milk by freezing, so that an adequate supply may be constantly available. Such a supply of breast milk is an important factor in any program for premature infants.

The care of premature infants constitutes a distinct specialty within the specialty of pediatrics. More knowledge concerning the fundamental policies underlying the requisite medical care based on the differences in anatomy and physiology and health needs of an infant born prematurely, and a wider dissemination of such knowledge, is needed.

SUMMARY AND CONCLUSION

The favorable change in infant mor-

tality has occurred chiefly in the age group 1 month to 1 year, and there has been comparatively little change in the neonatal mortality rate. The reason for this difference would seem to be that the child hygiene program is not adapted to affect the chief causes of neonatal deaths. There is need for a more adequate prenatal program closely allied to an obstetrical program.

Health education, the control of syphilis, the care of premature infants, intensified maternal and infant work suited to the needs of local areas, and adequate, easily available obstetrical facilities are all points of attack on this problem.

While the infant mortality rate as a whole is decreasing and is apparently favorably affected by the maternal and child health program, the real challenge in New York City lies in the field of neonatal mortality.

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Preliminary Report of the Sub-Committee on the Educational Qualifications of Public Health Statisticians*

IN its study of efforts to formulate an educational program of professional study for young men and women who anticipate public health statistics as careers, your Sub-Committee on the Professional Education of Public Health Statisticians prepared a questionnaire concerning this matter and submitted it to a number of recognized public health statisticians in our country for criticism, comment, and suggestions. An analysis of the received questionnaires shows a wide range of opinions. The extent of education and training that should be prescribed according to these returns runs from—" college course not necessary, however not detrimental " to " Master's degree and Doctor's degree."

The American Public Health Association's Committee on Professional Education, in its deliberations on professional education and training for other fields of public health so far considered by it, leans toward the principle that education and preparation for given fields of service should be on as high a level as is consistent with indicated needs, and that it should formulate and recommend comprehensive professional education programs of study toward the achievement of which we should *strive,* rather than stipulate training curricula based on the educational qualifications of the average incumbent in public health today.

The Sub-committee on Professional Education for Public Health Statisticians, recognizing that principle, presents and recommends in this report a professional education curriculum to work *toward* rather than an educational requirement to be demanded at once of all public health statisticians. In view of the returned questionnaires, we realize that many public health statisticians now in the field will regard the qualifications recommended as being too high. Others will feel they are inadequate.

To the former we may call attention to the fact that a number of universities are ready to provide programs of study in public health statistics according to the recommendations in this report. To the latter we suggest acceptance of this level as the first step. The future, doubtless, will bring modifications and further changes.

Your sub-committee wishes to emphasize at this point that it is not the intention that those now in the field of public health statistics rendering satisfactory and praiseworthy service but

* The Committee on Professional Education of the American Public Health Association publishes this Report of the Sub-Committee to permit the members and Fellows of the American Public Health Association to review it and to offer criticisms and suggestions to the Committee in the further consideration of the report.

who do not meet the educational qualifications recommended in the following report shall be supplanted by those who meet them. The committee recommends that the following program of study be accepted as a guide for study and preparation for young men and women who anticipate careers as public health statisticians.

RECOMMENDATIONS

The Sub-committee on the Professional Education for Public Health Statisticians, recommends that at least 1 year of prescribed graduate professional education, leading to the Master's degree or certificate, subsequent to graduation from college, and at least 3 months of directed practical public health statistical experience in a recognized public health or related agency, be approved and declared as the educational qualifications and training for public health statisticians, toward which we should plan, for the future.

I. *College Education*—A broad cultural education which can be obtained in a recognized college of arts, science, and literature is highly desirable. The subjects which should be elected in the college and regarded as prerequisites, more or less, to public health statistics fall into 4 groups. These are as follows:

1. Mathematics: Algebra, Geometry—Plane and analytic, Trigonometry, Calculus, Elementary mathematical analyses and statistics
2. Physical Sciences: Chemistry and Physics
3. Biology: General Biology or Zoölogy, including Vertebrate Anatomy, Physiology, and Bacteriology
4. Social Sciences: Sociology, Economics, and Government

These 4 groups of courses may be regarded as basic preparation for the profession of public health statisticians. However, they should not be too intensively and extensively pursued, so that other subjects of cultural value are omitted. Among these other subjects, one cannot emphasize too much the importance of English, including diction and composition. The presentation and interpretation of health statistics to the public in an interesting and impelling manner is one of the important needs of our time. History, philosophy, logic, anthropology, German, and French are other subjects which have been accentuated by public health statisticians.

It is apparent that it would be difficult, probably impossible, for the future public health statistician to complete all the courses recommended and stressed during his undergraduate education.

II. *Professional Graduate Studies*—In addition to the undergraduate work outlined, at least 1 year of professional graduate work, leading to the Master's degree or certificate in public health, in a university adequately equipped to offer this instruction, is recommended as the professional educational qualifications toward which we should strive. The following program of study is suggested although this may be modified, of course depending on the previous college education:

1. *Statistics*—It is obvious that the study of general and public health statistics is fundamental. It should be pursued throughout the academic year. A course in the theory and application of general statistics should be followed by one in public health statistics
 a. Theory and Application of Statistics—The contents of this course should include: theory of measurements and their precision; methods of classification, generalization, comparison, display of facts, and conclusions; methods of standardization and correction of rates; mathematical grouping and graphic presentation; study of tabulation—statistical machine methods; errors in raw material—statistical; elements of statistical surveys and studies; theory of proba-

bility—permutations and combinations; simple, partial, and multiple correlations; elementary time series; curve fitting; interpolations and predictions; probable and standard errors and their uses; averages; sampling; regression lines; growth curves; measurement of variation; measures of central tendency.

b. Public Health Statistics—History, nature, and purpose of vital statistics; population, including methods of population estimates; life tables; methods of collection and tabulation; general and specific rates, including birth rates, death rates, infant mortality, etc.; standardization of rates; registration areas; analyses of mortality and morbidity rates; probability; the effect of such factors as age, sex, race, etc.; federal, state, municipal, and county vital statistics; elements of statistical surveys; critical survey of appraisal forms.

It is obvious that courses in statistics will vary and that the items stipulated in each course will not be followed in the order designated. Moreover, it is apparent that in some courses offered, public health statistics will be built more closely into general statistics in such a manner that the items in the one will be included in the other, and *vice versa*. The items included in these courses have been suggested by recognized public health statisticians.

Each course should be supplemented with adequate laboratory work, including the operation of computing, punching, sorting, and tabulating machines.

2. *Personal Hygiene*—Eugenics and euthenics; Due consideration should be given to the following factors: air and ventilation; nutrition; mental hygiene; poisons; mechanical injuries; illumination; exercise; rest; fatigue; morbid processes and defects which are prone to develop during the various age periods of life, including cancer and the degenerative group of diseases; hygiene of special senses and systems, accompanied by review of anatomy and physiology of organs and systems considered; periodic health examinations; prevention, correction, or control of defects; social significance of disease.

3. *Communicable Diseases and Epidemiology*—The nature, source, classification, routes of transmission, and the general and specific procedures for preventing and controlling communicable diseases. Rules and regulations for control, including isolation and quarantine. General procedures: water purification, sewage treatment, refuse disposal, milk control, food inspection and control, eradication of insects. Specific measures: biologics, immunization. Other diseases and disorders of community interest. General epidemiological procedures. Geography of disease. Seasonal variations.

4. *Nosology*—Nomenclature and classification of diseases; standard classified nomenclature of diseases; international list of causes of death; ill-defined diseases and undesirable terms; combined causes. It is recommended that this course be presented in so far as it is feasible with pathological and clinical demonstrations.

5. *Graphic Methods*—Principles of elementary graphic presentation, functions of charts; preliminary procedures in making charts; classification of charts on various bases; details of form-dimensions, types of scales, position of scales; method of differentiating several parts; purpose for which used; circumstances under which used; types of comparison to be made; methods of reproduction; points to be considered in making chart or graph; types of charts and graphs; types of paper used for graphical work; instruments.

6. *Public Health Law and Administration*—Public health laws and regulations, police power, enforcement of public health laws, advisory powers of board of health, public health authorities, organization and administration of governmental health agencies—federal, state, municipal, and county, including services; nursing, hospital, health education, sanitation, maternity, and infant, preschool and school, industrial, statistics, communicable diseases and epidemiology, public health laboratories.

7. *Laboratory Health-Medical Sciences*—In view of the fact that the human body, normal and abnormal, is the center of interest in public health statistics, it is obvious that the public health statistician should possess a "working knowledge" of the normal structure and functions of the human body and with the morbid processes which effect it. It is, therefore, recommended that the professional educational and training program of study for public health statisticians include, in addition to

bacteriology, which is prescribed as an admission requirement, substantial courses in anatomy, physiology and pathology. These courses in the health-medical laboratory sciences need not be so intensive and extensive as those prescribed for medical students. They can be modified with a view of meeting the needs of public health statisticians and for the other public health services for which a thorough training in medicine is not essential.

III. *Suggested Schedule*—Those concerned with the professional education for the several fields of public health may be interested in the following schedule which is suggested for universities on the semester plan. It can be modified readily for the trimester or quarter systems.

First Semester

Courses
- General Statistics
- Personal Hygiene
- Drawing—Graphic Methods
- Anatomy
- Physiology

Second Semester

Courses
- Public Health Statistics
- Communicable Diseases and Epidemiology
- Public Health Law and Administration
- Nosology
- Pathology

IV. *Practical Field Work*—Satisfactory completion of a program of study as recommended above should be followed by at least 3 months of supervised practical work in a recognized bureau of public health statistics in a governmental health department. The degree of Master of Science in Public Health or Public Health Statistics or Certificate in Public Health Statistics should be conferred on the student who has completed both the program of study in the university and the field work.

V. *The Doctor's Degree in Public Health Statistics*—Both the program of study and the field work outlined and recommended in this report have been concerned wholly with the general professional educational qualifications which should be designated by the Committee on Professional Education of the American Public Health Association, for public health statisticians in the future. The committee, however, should call attention to the opportunities and needs for more extensive and intensive education and training in this field and related fields. In a measure, this is a statistical age. Men and women of the highest educational qualifications will be needed for teaching, research purposes, and for the direction of statistical surveys, and so on. Some suggest that the public health statistician should be a graduate of medicine or possess a Doctor's degree in Public Health.

In any event, universities equipped to do so should offer opportunities for advanced education and research in public health statistics and the related fields including biometry and medical, social, and economic statistics, leading to the Doctor's degree—Ph.D., D.Sc.

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Preliminary Report of the Sub-Committee on the Educational Qualifications of School Health Educators*

FROM its inception, the Committee on Professional Education of the American Public Health Association has been mindful of the significance of the modern public school health education movement and the obligations of the committee in helping the public schools to initiate and carry on comprehensive and constructive health programs. The proverb: "Train up a child in the way he should go and when he is old, he will not depart from it," possesses a most important implication in respect to public health work in general and public school health work in particular.

In the modern public school movement, attempts are being made on the part of several professional groups with different educational qualifications to assert themselves as being best qualified to teach health and supervise school health programs. As a consequence, schoolmen in many parts of our country are confused as to what constitutes effective and balanced programs of school health education, and who should be at their helms. The public schools are in particular need of assistance and guidance in matters pertaining to the teaching of health and to the application of hygienic and sanitary measures which insure healthful living and health services.

Scientifically and pedagogically sound school health programs will be forthcoming only when the teachers and supervisors of school health are adequately educated and trained for this work. Therefore the Committee on Professional Education of the American Public Health Association is of the opinion that the most significant contribution it can make to the modern school health movement is to determine and recommend what should constitute the professional educational qualifications, with particular reference to the basic sciences, of young men and women who anticipate school health work as careers.

The Sub-Committee on the Educational Qualifications of School Health Educators of the Committee on Professional Education, after consultation with a number of recognized leaders in the field of school health work, submits its report and recommendations. However, in submitting this report, the subcommittee is mindful of the fact that many men and women in our country who may not be able to measure up to all of the professional educational

* The Committee on Professional Education of the American Public Health Association publishes this Report of the Sub-Committee to permit the members and Fellows of the Association to review it and to offer criticisms and suggestions to the committee in the further consideration of the Report.

qualifications specified in this report, have contributed and are contributing immeasurably to the modern public school health education movement. Assuredly, men and women with these interests and activities who are included in this group, should be encouraged to continue in this work. The professional educational qualifications specified in this report should be regarded as something to strive for or work toward, rather than as an educational requirement to be demanded in the near future. The program of study put down in this report should be considered as a guide to the young man or young woman in the college who is looking forward to school health work as a profession.

As the sub-committee views it, the professional education of a young man or young woman who anticipates a successful and effective career in school health education falls into three groups of studies:

1. *Scientific Education*—Substantial education in those sciences which acquaint one with the human body, its make-up or structure, its workings or functions including development and growth, and its protection and care.

2. *Pedagogy*—Studies of those subjects which acquaint one with the history, philosophy, psychology, principles and practices of public school education, in order to make a genuine schoolman or schoolwoman out of the prospective health educator and in order to meet the requirements for teachers' certification or licensure.

3. *Special*—Methods and Materials in health teaching. Special health problems and needs of the child. Healthful school living. School's health service.

I. SCIENTIFIC EDUCATION

The first essential in effective teaching is to know thoroughly the subject matter to be taught. The first interest, on the part of a superintendent or principal of a school in his consideration of a prospective teacher of chemistry, would be how much chemistry does the candidate know? What has been the quality and quantity of his training in chemistry? Having satisfied himself on this point, the school administrator would then attempt to appraise the candidate's knowledge of pedagogy in general and of his knowledge of special methods and materials for teaching chemistry. The candidate's knowledge of general pedagogy and of special methods and materials in teaching chemistry is gained, generally speaking, from courses pursued in a teachers' college. Precisely the same attitude should be taken toward the qualifications of the teacher or supervisor who is being considered for school health work. Certainly, a working knowledge of those sciences which acquaint one with the structure or make-up, workings or functions, and the care of the human body-machine, should be regarded as the primal requirement of the candidate for a position of teacher or supervisor of a public school health education program. Studies of human anatomy, both gross and microscopic, including embryology and genetics, acquaint one with the make-up and development of the human body. Knowledge of the workings, functions, and growth can be gained only through studies of physiology, biochemistry, and psychology. To know how to take care of the human body-machine, one must have had substantial education in the fundamentals of physiologic or individual hygiene and of community hygiene for a population group as a whole or for special groups such as industrial in hygiene, as well as in those sciences which acquaint one with the nature of morbid processes which incapacitate or destroy the body; namely, bacteriology and general pathology. The courses in hygiene and their contents which should be pursued in order to qualify for school health teaching and supervision may be put down as follows:

1. *Physiologic Hygiene*—Physiologic, personal, or individual hygiene should include due consideration of the following factors: (1) Air—modern conception of ventilation including shelter—housing, clothing; (2) Water—physiologic and daily hygienic needs; (3) Nutrition—the balanced diet, as measured in terms of proteins, carbohydrates, fats; vitamins and minerals; (4) Light—illumination, ultra-violet rays; (5) Body poisons—bacterial poisons, drugs, chemicals—industrial hygiene; (6) Mental hygiene and the social and economic factors involved in body-mind-emotional disorders; (7) Mechanical world—with particular reference to violence, injury, accidents; (8) Periodic health examinations; (9) Nature—early detection, correction or control of body-mind-emotional defects which are prone to come on during the several age periods of life; (10) Special physiology and hygiene of the several systems in the body including the sense organs and sex physiology and hygiene; (11) Physiology and hygiene of exercise; and (12) Rest, sleep, and avoidance of fatigue.

2. *Community Hygiene* — One's knowledge of the principles and practices of community hygiene must be built on a course in general bacteriology and should be gained in the pursual of a general course in communicable diseases and epidemiology which includes the following topics: (1) Nature and classification of parasites responsible for communicable diseases; (2) Source of communicable diseases—man and animal; (3) Principles and practices of direct and indirect contact infection; (4) Classification of parasitic diseases according to discharges; (5) Routes over which communicable or parasitic diseases are disseminated; (6) General methods for blocking these routes, including water purification, sewage and refuse treatment and disposal, food and milk control, and eradication of diseases conveying insects; (7) Specific procedures for blocking certain communicable diseases including the classification and use of biologics; (8) Epidemiological procedures.

3. *Public Health Administration*—Certainly one who anticipates a career in health education, whether public school health education or adult public health education—popular health instruction—should possess a working knowledge of public health administration or applied hygiene; the principles and practices of physiologic hygiene and of community hygiene as applied to a community as a whole or to maternity and infancy, to children including school health work, and to adults including industrial hygiene. The special interests and activities and personnel of a public health department, including public health statistics, epidemiology, sanitation, laboratories, public health nursing, and so on, should be familiar to one who anticipates a career in school health education, not only for purposes of instruction but also for tying up more closely the health interests and activities of the school with those of the local health department. Some field observation and work is highly recommended.

II. PEDAGOGY

The teacher or supervisor of a public school health education program should be a genuine schoolman or schoolwoman in every respect, one who "understands and can speak the language of public school education," one versed in and permeated with the spirit and atmosphere of the public school educator. Therefore, studies in the history, philosophy, psychology, principles and practices of education should be followed with a view of meeting the requirements for certification and with a view of becoming permeated with the atmosphere

of public school work. Teachers or supervisors of public school health education should meet the same requirements for certification as are now met by schoolmen and schoolwomen in general. In so doing, not only is the desired public school education spirit engendered in the prospective health educator, but pursual of these studies in pedagogy, obviously, should decidedly enhance the capacity for effective teaching. Of course health education will always be interested in any improvement in the contents or interrelation of these courses which will contribute to more effective teaching in general.

III. SPECIAL EDUCATION

1. *Methods and Materials in Health Teaching*—The school health educator should be familiar with methods and materials in health teaching. Many studies and contributions in recent years, have been and are being made to health teaching in the various grades, both as independent instruction and in correlation with other school subjects and of the rôle that the classroom teacher should play in the school's health program. Obviously, all these matters pertaining to health teaching should be given due consideration in a course or courses prescribed in a professional curriculum for the training of health educators.

2. *Special Health Problems and Needs of the Child*—Special education and training relative to the health needs of the child are required of him or her who is to function adequately in school health teaching and supervision. A course or courses should be presented with a view of correlating and applying those medical-health sciences specified above (Scientific Education), to the living, growing, dynamic child. Due consideration should be given to the significant changes in structure and function throughout the period of growth of the child and with its health needs arising out of conflicts between environmental factors and the child's growth and developmental needs. Such special health factors as nutrition; mental hygiene, including personality and child guidance; periodic health examinations; prevention, early detection, and correction of defects; protective inoculations; school epidemiology, and sanitation; should be given their due consideration in this course.

3. *Healthful School Living* includes such factors as the hygienic planning or arrangement of the school program, teacher-pupil relationships, interest in the whole life of the child, home and school, with a view of doing something salubrious about it. Interests and activities for healthful school living may be regarded as the "doing" or laboratory phases or aspects of health teaching.

4. *School Health Service*—The interests, activities, organization, and administration of the school's health service should be an important part of the educational and training equipment of the school health educator. The health service should be regarded as another of the "doing" or laboratory aspect of the school's health program. Some would combine the interests and activities of healthful school living with those of the health service. Naturally, the relation of the health service to the family physician should be duly considered. Of course, in school health programs, it is desirable that health teachers participate to their fullest capacities in the "doing" or laboratory phases of a school health education program. Likewise, those whose interests are primarily in the health service work should take part in teaching. Both principles-teaching and practice-participation should be expected of all who take part in the school health program. Those who participate in the school

health program as teachers or supervisors should be alert to the health aspects of living in the school and have a responsibility also for guiding classroom teachers not only in the recognition of health problems, but also in the effective handling of them. It is understood that this education and training specified under " Special Education " should be so presented that the student will possess a clear picture of a correlated and balanced school health program as a whole, both in respect to health teaching and administration of the school health program.

If we accept the proposition that these 3 groups of studies, (1) Scientific Education, (2) Pedagogy, and (3) Special Education, should be regarded as essential for the preparation of the teacher or supervisor of school health education, it is obvious that the professional education of the school health educator should be done in a university in which the so-called basic health and medical sciences are offered; namely, anatomy, physiology, bacteriology, pathology, and hygiene, and in which a department or school of education is maintained or in other institutions of higher learning where close coöperation exists between these teaching units. In general, the progression to be followed in preparation for a career in school health education may be outlined as follows:

IV. UNDERGRADUATE WORK

The college work should be on a broad cultural basis. However, if one anticipates and plans his studies for a career in health education, early in college life, the necessary physical and biological sciences may be adequately pursued. At any rate, substantial courses should be completed in physics, chemistry, and biology. If possible, biology should include vertebrate anatomy, physiology, and a general course in bacteriology. General courses in psychology and sociology should be completed.

The senior year or a portion thereof should be devoted to studies, offered in the department or school of education in the university, along the lines of the history, philosophy, psychology, principles and practices of public school education. It is assumed that practice teaching is included. The prescribed or recommended courses which will qualify one for the teacher's certificate or licensure should be completed. In other words, according to this recommended course of study in the college, the student has been educated and trained for a career as a public school teacher with a major in the biological sciences and a minor in the physical sciences.

V. GRADUATE WORK

The admission requirements to the graduate school (Bachelor's degree), should specify the completion of substantial courses in the physical and biological sciences and in pedagogy according to the recommendation made relative to undergraduate work. At least 1 year of graduate work leading to the degree of Master of Science in Public Health or School Health Education or an equivalent degree or certificate is recommended. The following graduate program of study is recommended:

Sciences—Those sciences which acquaint one with the structure, functions, and care of the human body.

1. Anatomy—Gross and Microscopic—Embryology
2. Physiology, including Biological Chemistry
3. Physiologic Hygiene (Personal Hygiene)
4. Pathology (Bacteriology prescribed for entrance)
5. Community Hygiene
6. Public Health Administration

School Health Program—Organization and administration of comprehensive and con-

structive school health programs including:

1. Methods and Materials in Health Teaching
2. Special Health Problems and Needs of the School Child
3. Healthful School Living
4. The School's Health Service

It is recognized that the program of study offered as graduate work will be varied in accordance with the undergraduate education and training of different students. For example, public school health educators are now being recruited from several of the health-medical professions; namely, medicine, dentistry, nursing, nutrition, from physical education, and from public school educators who have majored in the biological and, perhaps, the social sciences. The physician going into school health work will have had satisfactory training in the sciences before he begins this curriculum. He may have had none of the courses which make up pedagogy. Therefore, courses in the history, philosophy, psychology, principles and practices of public school education must be made available to him in this graduate program of study. Likewise, in varying degrees, for the other health sciences' professions. On the other hand, physical educators and schoolmen interested in school health work as careers, ordinarily, will have to devote much of their time and efforts to the study of the medical-health sciences. Thus, it is seen that the graduate program of study will have to be modified or differentiated in order to meet the individual needs of professional students until that time comes when professional education programs of study for school health educators will become generally recognized and established.

VI. PRACTICAL EXPERIENCE

One cannot emphasize too much the importance of supervised practise teaching of health and of directed participation in the "doing" aspects of the school's health program including the activities for healthful school living and those of the health service, in order fully to qualify as a school health educator. Therefore, a tenure of directed practice and experience in a recognized school health program should be included in a professional program of study in school health supervision before the Master's degree is conferred. Obviously, in school health teaching and supervision, wholesome, positive, dynamic health should be an outstanding characteristic of one who is to be at the helm of the school health program. This should be regarded, perhaps, as the outstanding personality qualifications to be required of the teacher and supervisor of a school health program.

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Preliminary Report of the Sub-Committee on the Educational Qualifications of Adult Health Educators*

IN times past, public health agencies were almost wholly concerned with the prevention and control of communicable diseases. The greatest accomplishments have been made in the control of certain diseases by legislative enactment, enforcement of regulations, and supervision. This is particularly the case with those bacterial diseases which are spread by indirect contact infection, as in water, milk, food, and by insects. Water purification, sewage treatment and disposal, pasteurization, food inspection and control, drainage, and so forth, have eliminated or minimized the dangers in our country of those parasitic diseases which made up the formidable epidemics and pandemics.

As a result of the great accomplishments of public health in prevention and control of communicable diseases, the new public health is becoming more interested in personal hygiene, including such health factors as periodic health examinations; the prevention, early detection, and correction of body-mind-emotional defects including the defects which are prone to come on during the various age periods of life, including degenerative diseases and cancer; nutrition; mental hygiene; ventilation; and other factors which may be specified. Obviously, we cannot set up laws, establish mechanisms, and employ experts to deal adequately with the several factors which are included in physiologic hygiene. Progress and achievement in physiologic hygiene can be brought about only by means of popular health education. This is also true, in a very large measure, of our efforts to deal with those diseases which are spread by direct contact infection.

Thus, it is seen that the education of the masses in the fundamentals of public health has become one of the outstanding interests and activities of the modern public health movement. We must now begin to look at the public health educator as one of the most important functionaries in modern public health and look to his education and qualifications in the same way in which we do the education of other types of public health personnel.

RECOMMENDATIONS

The Sub-Committee on the Educational Qualifications of Health Educators (Adult Health Educator-Popular Health Educator) of the Committee on Professional Education, after consultation with a number of recognized leaders in the field of popular or public health education, submits this report. The report should serve as a *guide* to young men or women who are

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looking forward to this important and promising field of public health as careers.

The professional education of the public health educator falls into 3 general groups of studies: (1) Scientific Education, (2) Methods and Materials in Public Health Education and Publicity, (3) Practical Field Work Experience.

1. *Scientific Education*—All public health interests and activities center in the human body and its welfare. Obviously, in order for the public health educator to function adequately in popular health education, he should possess a substantial education in those sciences which acquaint him with the make-up or structure, the workings or functions, and the care of the human body as a whole. A working knowledge of these sciences adds immeasurably to the effectiveness of the public health educator, and enables him to realize the relative values and social significance of disorders toward which health education is directed.

Human anatomy, both gross and microscopic, including embryology and genetics, acquaints one with the structure and development of the body. A knowledge of physiology, biochemistry, and psychology is essential in order to understand the function, growth, and development of the body as a whole. To know how to take care of the human body, one must be familiar with those sciences which give him knowledge of the nature and causes of morbid processes; namely, bacteriology and pathology. One must have had also some substantial courses in hygiene, public health, and preventive medicine including the fundamentals of physiologic hygiene, community hygiene and epidemiology, and public health administration in general.

2. *Methods and Materials in Public Health Education and Publicity*—The technic of public health adult education differs from that of school health education in several respects. For the latter, courses in the history, philosophy, psychology, principles and practices of public school education are recommended and prescribed in order to make a genuine school man or woman out of the prospective school health educator and in order for him or her to qualify for certification. While some knowledge of the principles and practices of education is desirable and essential for the public health educator, the sub-committee does not feel that it is essential at this time to prescribe as extensive a study of those educational courses specified for the school health educator. It is of the opinion, however, that the public health educator should have had some substantial courses in the philosophy and psychology of public school education and of adult education. Assuredly, he should possess a working knowledge of the philosophy and psychology of education as these are applied to adult education. Methods and Materials in Adult Health Education should be familiar to him. Almost daily, new studies and contributions are being made to this subject. In addition to these important basic subjects which acquaint one with the educational aspects of public, popular, or adult education, the special technics of adult health education should be given due consideration in the professional education of the public health educator. These are: public speaking; journalism; feature writing; community newspaper; radio and visual education, including placards, posters, stereopticon, and cinema; demonstration, including exhibits, fairs; perhaps some instruction in the psychology of writing and advertising.

3. *Practical Field Experience*—The sub-committee is of the opinion that

at least 3 months of supervised practical experience in a public health department or agency in which recognized public health education is being effectively carried on should be stipulated for the public health educator of the future.

The extent of study of all the courses stipulated above and their contents need not be put down in this report. The contents of courses in anatomy, physiology, psychology, biochemistry, bacteriology, and pathology are fairly well determined. Whether the contents of these courses as now being prescribed for medical students, should be taken by students going into the several fields of public health work for which preparation in medicine is not a requisite, is a matter that will be taken care of in the future. Perhaps, for the present, special courses can be arranged for students in public health. It is anticipated and recommended that all the courses advised: in the sciences, in education, and in methods and materials in public health education, including those subjects which acquaint one with the several avenues of public education, be given as comprehensively and substantially as possible.

In view of the interest expressed by those from whom opinions have been sought relative to the formulation of this report, in the contents of courses recommended in hygiene and public health, the suggested make-up of physiologic hygiene, community hygiene, and public health administration are herewith stipulated:

1. *Physiologic Hygiene*—Physiologic, personal, or individual hygiene should include due consideration of the following factors: (1) Air—modern conception of ventilation including shelter—housing, clothing; (2) Water—physiologic and daily hygiene needs; (3) Nutrition—the balanced diet, as measured in terms of proteins, carbohydrates, fats; vitamins and minerals; (4) Light—illumination, ultra-violet rays; (5) Body poisons—bacterial poisons, drugs, chemicals—industrial hygiene; (6) Mental hygiene and the social and economic factors involved in body-mind-emotional disorders; (7) Mechanical world—with particular reference to violence, injury, accidents; (8) Periodic health examinations; (9) Nature—early detection, correction or control of body-mind-emotional defects which are prone to come on during the several age periods of life; (10) Special physiology and hygiene of the several systems in the body including the sense organs and sex physiology and hygiene; (11) Physiology and hygiene of exercise; and (12) Rest, sleep, and avoidance of fatigue.

In the study of these factors which make up physiologic hygiene, the relative values of each for the various age groups should be emphasized. Differentiation should be made between those factors based on scientific experimentation and observation and those which are based largely on opinion or empiricism. Fads and frauds are common in respect to several of these factors. Therefore, they should be given due consideration in the course in order that the public will be told about them later on. The rôle that the home, school, and community should play in the comprehensive and constructive program of physiologic hygiene should be clearly brought out in the courses.

2. *Community Hygiene* — One's knowledge of the principles and practices of community hygiene must be built on a course in general bacteriology and should be gained in the pursual of a general course in communicable diseases and epidemiology which includes the following topics:

(1) Nature and classification of parasites responsible for communicable diseases; (2) Source of communicable diseases—man and animal; (3) Principles and practices of direct and indirect contact infection; (4) Classification of parasitic diseases according to discharges; (5) Routes over which communicable diseases or parasitic diseases are disseminated; (6) General methods for blocking these routes, including water purification, sewage and refuse treatment and disposal, food and milk control, and eradication of disease conveying insects; (7) Specific procedures for blocking certain communicable diseases, including the classification and use of biologics; (8) Epidemiological procedures.

3. *Public Health Administration*—Certainly one who anticipates a career in health education, whether public school health education or adult public health education—popular health instruction—should possess a working knowledge of public health administration or applied hygiene; the principles and practices of physiologic hygiene and of community hygiene as applied to a community as a whole or to maternity and infancy, to children (including school health work) and to adults (including industrial hygiene). The special interests and activities and personnel of a public health department, including public health statistics, sanitation, epidemiology, laboratories, public health nursing, and so on, should be familiar to one who anticipates a career in adult health education. Some field observation and work is highly recommended.

PROGRAM OF STUDY

Following the general procedure of the Committee on Professional Education of the American Public Health Association, to recommend professional educational qualifications for personnel in several fields of public health on as high a level as possible with a view of meeting the future needs as it sees the problem, and with a view of serving as a guide for those who anticipate careers in public health education, the following program of study is recommended:

1. *Undergraduate Work*—The college work should be on a broad cultural basis. Substantial courses in English and particularly in composition and writing; public speaking; philosophy; biology; chemistry; psychology; sociology; and government should be completed. During the upper-classmen years, such subjects as the philosophy and psychology of public school education and of adult education should be included. There should be a thorough preparation for graduate work, but this need not be done in a manner to sacrifice the broad cultural interests in education.

2. *Graduate Work*—The admission requirements to the program of study in public health education should be graduation from a recognized college. The under-graduate work should include those courses prescribed. The degree of Master of Science in Public Health or Public Health Education, or its equivalent such as the certificate, should be conferred upon the satisfactory completion of the following curriculum and after the successful completion of the practical field experience. Of course, it is understood that this program of study will be subject to much modification in view of the fact that students will enter it with considerable variation in the previous college education. For example, those going into this field from the medical profession will already have completed the health-medical sciences and, as a rule, will be deficient in the educational courses.

The courses recommended in this

program of study in public health education offered as graduate work include:

1. Anatomy—Gross, Microscopic—Embryology
2. Physiology, including Biological Chemistry
3. Pathology
4. Physiologic Hygiene
5. Community Hygiene
6. Public Health Administration, including Public Health Statistics

The other subjects prescribed in the graduate school should include certain courses which acquaint one with the technic of adult health education; namely:

1. Philosophy and Psychology of Adult Education
2. Methods and Materials in Adult Health Education
3. Feature Writing
4. Advanced Public Speaking
5. Community Newspaper
6. The Significance of Demonstration and Fairs in Public Education
7. Cinema and Radio in Adult Education
8. Psychology of Advertising — Posters, Placards, etc.

After the completion of this curriculum, 3 months of directed practical work in public health education in a recognized health department or agency should be required before the Master's degree or certificate is prescribed.

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Institutional Mortality With Reference to Residence Allocation*

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THE statistical treatment of deaths in state and federal institutions is a matter of importance, because these deaths form a considerable proportion of the total mortality, and an even greater part of the specific mortality from certain causes. In New York State, exclusive of New York City, for example, the inmates of state and federal institutions in 1935 represented 1.5 per cent of the population, but were responsible for 6.5 per cent of all deaths, 21.8 per cent of the deaths from tuberculosis, and 9.8 per cent of the deaths from pneumonia.

If the weight of the institutional mortality is considerable in an area as populous as the state, even without New York City, it is a factor of much greater importance in the small cities or rural areas in which many institutions are located. Take, for example, the rural section of one of the New York counties, Dutchess, which has two state hospitals, a State School for Mental Defectives, and a Veterans' Administration Facility within its boundaries. In 1935, of 1,393 deaths recorded in the county, 788, more than half, occurred among the institutional population of 11,344, while the rest, 605, represented the mortality among the general population of 46,003. The death rate of the area, based on the total mortality, including that in institutions, was 24.3, but only 13.2 when the deaths and population of the institutions were excluded. The high rate of 24.3 surely cannot be taken as a measure of mortality in the rural area of Dutchess County because most of the inmates of the institutions were non-residents of the county, and in the case of the federal hospital, non-residents even of the state.

The need for a correction of the death rates is, therefore, self-evident. The method employed by the U. S. Bureau of the Census in allocating deaths of non-residents to place of usual abode does not solve the problem, because for inmates of a custodial institution the "usual place of abode" is defined as the institution. At the same time, the institution is considered an integral part of the area in which it is located. The error contained in the death rates produced by this method of allocation, which has the outstanding advantage of simplicity, would be largely eliminated if the deaths and population in institutions were shown

* Read at a Joint Session of the State Registration Executives and the Vital Statistics Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 22, 1936.

From the Department of Biostatistics of the School of Hygiene of The Johns Hopkins University, Paper No. 202, and the Division of Vital Statistics, State Department of Health, Albany, N. Y.

separately from those in the communities in which they are located.

Another way of dealing with the problem would be to change the definition of residence as applied to inmates of custodial institutions, and allocate all deaths among them to the place of residence at the time of admission. That the population of the institutions cannot be similarly allocated need not cause concern, since the resulting error in the death rates is negligible—probably less than that caused by errors in ordinary estimates of population.

The principal arguments against this procedure arise from the fact that, on the one hand, many of the deaths are caused by diseases which originated or were first diagnosed in the institutions, and, on the other hand, many deaths follow such long periods of institutional life as to make their statistical transfer to former place of residence a questionable procedure. Here it is desirable to formulate clearly what one wishes to accomplish by means of allocation of deaths. One may either attempt to measure the mortality among residents of the several municipalities of the state, regardless of their movement within the state, or even beyond its boundaries, or to determine as accurately as possible the number of deaths from causes which had their inception in these municipalities. The distinction between these two concepts has been expressed most graphically by the late Dr. Stevenson, who in a letter to Dr. DePorte defended the allocation of all deaths, regardless of cause, to place of residence, institutional deaths to be transferred to the place of residence prior to admission:

> I am struck by a fundamental difference, of which I was already aware, between your conception in America of the task to be undertaken and ours. We aim merely at ascertaining the mortality experienced by each area, and not that for which it is responsible. Thus, for instance, in the case of deaths from violence we allocate these by preference to the district of residence, which is entirely ignored in your rules. We are both logical in what we do, but you aim higher than we.
>
> I do not claim that our residential mortality basis always yields ideal results. It does not; but I think its simplicity and practicability are advantages far outweighing its disadvantages. When we get an outbreak of infectious disease in an asylum we are obliged to distribute the deaths to the area from which the patients were admitted, and in this particular case I can see advantage in your rule 4. But to adopt it to meet this special difficulty would be for us to admit the thin edge of the wedge, and after all it seems to me that one of the dangers of life in any area is that you may go mad and be sent to an asylum where you may be infected with typhoid or dysentery.

Dr. Stevenson's remark that the aim of the New York State Health Department is higher than that of the office of the English Registrar General is, of course, only gentle sarcasm.

What the New York State Department has been endeavoring to do is to achieve a workable synthesis between the two points of view. It seemed to us that to allocate to place of residence deaths from automobile accidents, for example, or deaths resulting from diseases definitely known to have been contracted away from home, was not good logic. At the same time, in the case of chronic diseases, it is often impossible to ascertain where the disease had its inception; in such cases, the allocation has been to place of residence.*

If the mortality in state institutions is considered from this point of view, there can be little question about transferring to place of residence at time of admission the deaths from epilepsy, general paralysis of the insane, and dementia praecox—illnesses responsible for the admission of patients to institutions. It would also seem reasonable

* For rules of allocation employed by the New York State Department of Health, see the *Annual Reports* of the Division of Vital Statistics.

to charge an institution with deaths from acute communicable disease. One cannot, however, make such a clear-cut decision in the large group of deaths from chronic diseases, such as tuberculosis, cancer, diabetes, diseases of the circulatory system. To this group may be added the deaths from pneumonia, with which an institution would have to be charged if pneumonia is considered an acute infectious disease.

In order to determine what would be the most equitable distribution of institutional mortality, it would be very desirable to know of what this mortality consists—the causes of death, the interval between admission and death, and in the case of tuberculosis the number of deaths in which the disease apparently originated in the institution.

In 1935 in New York State, exclusive of New York City, 4,441 deaths were recorded in state and federal institutions. Of these, 348 were recorded in the Veterans' Administration Facilities. Since most of these hospitals admit patients for treatment rather than for permanent custody, the deaths in them do not present the same problem as the deaths in state institutions, and therefore they have not been included in the following tabulations. Similarly, 6 deaths in the State Hospital for Tuberculosis and 3 in the West Haverstraw Reconstruction Home (for orthopedic cases) have also been excluded. In New York State, institutions constitute separate registration districts. Each year a certain number of deaths of persons other than inmates (attendants, etc.) are registered in these institutional districts. It was considered impractical to exclude them from the 3,669 deaths in the state hospitals—they certainly form a very small percentage of the total. The deaths of persons who were not inmates have, however, been excluded from the records of all other institutions.

This leaves a total of 4,072 deaths—3,669 in hospitals for the insane, 212 in schools for mental defectives, 136 in Craig Colony for epileptics, 39 in prisons, 16 in other institutions.* The distribution of these deaths according to cause is shown in Table I.

It is seen that only 423, or 10.4 per cent, of the deaths were caused by general paralysis of the insane, dementia praecox and other psychoses, and epilepsy, and only 595, or 14.6 per cent by these diseases, cerebral hemorrhage, and other diseases of the nervous system. Diseases of the heart, diseases of the arteries, and acute and chronic nephritis were responsible for 43.8 per cent of the total. Tuberculosis and pneumonia each caused somewhat more than one-tenth of all deaths—10.8 and 10.9 per cent respectively.

These percentages remain practically unchanged if one considers only the state hospitals for the insane. In schools for mental defectives, tuberculosis was the most important cause of death, accounting for 22.2 per cent of all deaths, with pneumonia second and diseases of the heart third. In Craig Colony for Epileptics, 37.5 per cent of the deaths were ascribed to epilepsy, 25.7 per cent to pneumonia, and 8.8 per cent to tuberculosis. These differences are explained in part, at least, by the younger age distribution of the population in Craig Colony and the state schools.

Of the 39 deaths in prisons, 16 were legal electrocutions.

Tabulation of the deaths by length of stay in the institution shows that 40 per cent of all deaths were recorded within a year after admission, 71 per cent within 5 years. The median length of stay in all institutions was

* One in Westfield State Farm, 1 in the State Training School for Girls, and 14 in the Women's Relief Corps Home.

TABLE I

Deaths in State Custodial Institutions by Cause of Death: New York State (Exclusive of New York City), 1935

Cause of Death	New York State (Excl. of New York City)	All State Custodial Institutions	Hospitals for the Insane	Schools for Mental Defectives	Craig Colony for Epileptics	Prisons	Others
All causes	73,376	4,072	3,669	212	136	39	16
Tuberculosis, all forms	3,056	438	373	47	12	6	..
Pulmonary	2,839	424	363	43	12	6	..
Other forms	217	14	10	4	..	..	..
Syphilis	414	67	62	1	..	4	..
Other infectious diseases	1,497	46	32	13	1	..	..
Cancer and other malignant tumors	8,631	170	161	6	2	1	..
Diabetes mellitus	1,966	51	49	2	..	..	..
Cerebral hemorrhage, cerebral embolism and thrombosis	5,830	142	130	6	4	..	2
General paralysis of the insane	362	330	329	1	..	..	..
Dementia praecox and other psychoses	30	14	14	..	..	..	..
Epilepsy	150	79	25	3	51	..	..
Other diseases of the nervous system	798	31	19	11	1	..	..
Diseases of the heart	21,018	1,281	1,229	31	7	3	11
Diseases of the arteries	1,942	236	235	..	..	1	..
Pneumonia, all forms	4,633	443	372	33	35	2	1
Diarrhea and enteritis	374	21	12	9	..	..	..
Nephritis, acute and chronic	6,233	268	251	8	9	..	..
Congenital malformations and diseases of early infancy	2,612	24	8	14	1	..	1
Accidents	4,959	115	105	4	6	..	..
Legal electrocutions	16	16	..	..	..	16	..
All other causes	8,855	300	263	23	7	6	1

TABLE II

Deaths in State Custodial Institutions, by Length of Stay in Institution: New York State (Exclusive of New York City), 1935

Length of Stay in Institution	Total	Hospitals for the Insane	Schools for Mental Defectives	Craig Colony for Epileptics	Prisons	Others
Total	4,072	3,669	212	136	39*	16
Less than 1 year	1,622	1,493	77	26	24*	2
Less than 1 month	*488*	*465*	*15*	*8*	..	..
1 year	458	425	17	10	4	2
2 years	327	295	17	11	3	1
3 years	276	229	34	10	..	3
4 years	206	184	7	13	..	2
5–9 years	380	314	24	32	6	4
10 years and over	760	688	35	34	1	2
Not stated	43	41	1	..	1	..
Median length of stay	1.9	1.8	2.7	4.8	1.9	4.0

* Includes 16 legal electrocutions which were not considered in computing the median.

1.9 years—in hospitals 1.8, in schools for mental defectives 2.7, Craig Colony 4.8, prisons (excluding legal electrocutions) 1.9, and others, 4.0.

The problem of allocation is mainly one for deaths in state hospitals, which account for 90 per cent of the total institutional mortality. Table III shows the distribution of the hospital deaths according to cause and length of stay in a hospital. The median duration of residence varies from about 1 month for deaths from dementia praecox to 4 years for deaths from tuberculosis. This does not mean, of course, that the duration of life of patients entering with dementia praecox is so much less than for patients with other psychoses. Quite the opposite is true. In general, persons with dementia praecox live longer in the institution, but most of them succumb to other diseases.[1]

While the death rate from all causes is definitely higher immediately after admission—12 per cent of all deaths being recorded within a month—the death rate from pneumonia seems particularly high, 18 per cent of all deaths from that cause being recorded within the first month. Only dementia praecox and diabetes show a higher percentage, but the number of deaths from these causes is relatively small. Tabulation of the hospital deaths by age, shows that invariably the percentage of deaths soon after admission is higher for pneumonia than for other causes as a group. There is some evidence that persons subjected to a new environment are more susceptible to pneumonia than

TABLE III

Deaths in State Hospitals for the Insane, by Cause of Death and Length of Stay in Hospital: New York State (Exclusive of New York City), 1935

		Length of Stay in Hospital						
Cause of Death	*Total*	*Less than 1 Month*	*1 Month to 1 Year*	*1–4 Years*	*5–9 Years*	*10 Years and Over*	*Not Stated*	*Median*
All Causes	3,669	465	1,028	1,133	314	688	41	1.8
Tuberculosis, all forms	373	16	38	150	52	114	3	4.0
Syphilis	62	6	24	22	4	3	3	1.0
Other infectious diseases	41	2	10	15	8	6	..	2.4
Cancer and other malignant tumors	161	12	33	43	19	53	1	4.3
Diabetes mellitus	49	11	13	18	1	6	..	1.0
Cerebral hemorrhage, cerebral embolism and thrombosis	130	13	45	35	10	24	3	1.4
General paralysis of the insane	329	33	133	118	17	15	13	1.0
Dementia praecox and other psychoses	14	8	3	1	1	1	..	0.1
Epilepsy	25	3	3	10	4	5	..	3.6
Other diseases of the nervous system	19	3	2	10	4	..	..	3.1
Diseases of the heart	1,229	180	372	365	81	220	11	1.4
Diseases of the arteries	235	22	84	68	17	44	..	1.4
Pneumonia, all forms	372	67	111	95	34	62	3	1.2
Nephritis, acute and chronic	251	34	68	70	28	50	1	2.1
Accidents	105	15	31	35	5	18	1	1.4
All other causes	274	40	58	78	29	67	2	2.4

TABLE IV

Deaths from Tuberculosis in State Custodial Institutions: New York State (Exclusive of New York City), 1935

Length of Residence in Institution	Total		Indicated Duration of Tuberculosis							
	Number	Per Cent	Less than 1 Year	1–2 Years	2–3 Years	3–4 Years	4–5 Years	5–9 Years	10 Years and Over	Not Stated
Total	438	100.0	171	59	25	18	13	27	29	96
Less than 1 year	63	14.5	35	7	..	2	1	..	1	17
1 year	51	11.7	20	17	..	2	1	..	..	11
2 years	60	13.8	26	1	3	..	1	3	..	26
3 years	35	8.0	15	6	2	1	..	..	1	10
4 years	22	5.1	6	2	4	5	2	1	..	2
5–9 years	74	17.0	29	13	8	2	5	5	3	9
10 years and over	130	29.9	38	13	8	6	3	18	23	21
Not stated	3		2	..	..	..	..	..	1	..

if they have resided in a place for a period of time. In so far as this factor operates, institutional life might be said to increase the risk of dying from pneumonia. On the other hand, if length of residence is to be a criterion for the allocation of deaths to previous place of residence, these are the very deaths that could be allocated without question.

For inmates who die from tuberculosis, it is interesting to compare the duration of the illness as given on the death certificate with the length of stay in the institution. Of the 438 deaths from this cause in all institutions, the duration of the illness was stated in 342, or 78 per cent, and averaged 2.8 years (see Table IV). In only 69 cases was the indicated duration greater than the length of stay in the institution. On the other hand, in 171 deaths the duration was given as less than 1 year. This is the interval between diagnosis and death—it is extremely doubtful if the interval between the first manifestations of the disease and death could have been of such short duration in all these cases. For the purpose of allocating deaths from tuberculosis to place of origin of the disease, the information given on the death certificates is hardly adequate.

Deaths in custodial institutions are undoubtedly not in the same category as deaths recorded in other districts of the state. Persons in state hospitals and state schools were removed from their communities because of illness or mental defect. Most of those who die would have died if they had remained at home. Even if conditions of institutional life were the predominating factor—as Dr. DePorte has said elsewhere in discussing the mortality from tuberculosis in these institutions—"the first link in the chain of events was forged in the place in which the patient previously resided."[2]

It seems to us, therefore, that the most satisfactory procedure would be to allocate all deaths in custodial institutions, except those caused by acute communicable diseases, back to the place of former residence, thus distributing the institutional mortality throughout the state. This procedure is an arbitrary one, but probably the most practical solution of the problem in the present state of our knowledge.

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2. DePorte, J. V. Recorded and Resident Death Rates from Tuberculosis in New York State in 1926. *Am. Rev. Tuberc.*, XVII, 6 (June), 1928.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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REMEMBER THE EDITORS AND THE PRINTER

PRESUMABLY papers for our 1937 meeting are now in course of preparation. We venture to hope so, and, further, that no hurriedly written papers will be submitted.

We have from time to time submitted certain suggestions, and there is sent out from the office to every one on the program a sheet of plain directions as to manuscripts. It is remarkable how often these simple instructions are disregarded. For example, one of the very first rules in preparing a manuscript is to double space, and submit the original; yet every year we have a number of indistinct carbon copies single spaced, almost impossible to edit, and hard for the printer to set. Usually quotations are allowed to be single spaced. If they are accurate they should not need editing, but this *Journal* prefers to have everything that goes to the printer double spaced.

Short papers are more likely to be read and more likely to be published. But papers can be long at 500 words and short at 5,000, according to their material. The secret of brevity is repeated revision: the author's best friends are a month's delay and several candid critics.[1]

The majority of readers look for facts and conclusions. Those who wish to repeat the work or compare it with other articles on the same subject read the details. A number of very clever articles have been written on medical jargon which includes the overuse of words with abstract meanings: for example, "of a blue coloration" rather than simply "blue"; instead of "in a state of good health," say "in good health," etc.

The writer should not waste space and words in explaining that he believes so and so. We have a right to know that he would not put a statement in his paper if he did not believe it. If some doubt exists he can say "apparently,"

which is just as good as, "I cannot disguise from myself that it would appear that."

We wish that we could impress upon writers that they are assisting not only the editors and printer of the *Journal*, but themselves, in furnishing well prepared manuscripts. Inexact and carelessly written papers entail extra work all down the line and cause unnecessary expense due to necessary corrections and changes, as well as dissatisfaction to the authors, and criticisms of the printer. Wise as editors should be and may be theoretically, they cannot be omniscient. They are not mind readers, so cannot always guess correctly at the meaning of obscure statements.

Editors in various parts of the world are asking their contributors for better manuscripts. Some of the points here noted are from the wail of the Editor of *The Lancet*. From the *Canadian Public Health Journal*[2] we cull this excellent advice:

"If you've got a thought that's happy—
Boil it down.
Make it short and crisp, and snappy—
Boil it down.
When your brain its coin has minted,
Down the page your pen has sprinted,
If you want your effort printed,
Boil it down.
Take out every surplus letter—
Boil it down.
Fewer syllables the better—
Boil it down.
Make your meaning plain—express it,
So we'll know—not merely guess it,
Then, my friend, ere you address it,
Boil it down.
Skim it well—then skim the skimmings—
Boil it down.
When you're sure 'twould be a sin to
Cut another sentence in two,
Send it on, and we'll begin to—
Boil it down."

REFERENCES

1. Supplement to *The Lancet*, Jan. 2, 1937
2. *Canad. Pub. Health J.*, Oct., 1936, p. 517.

An article on writing for this *Journal* is in course of preparation for distribution to our contributors.

EIGHTH ANNUAL MEETING OF THE WESTERN BRANCH, A.P.H.A.

THE eighth annual meeting of the Western Branch was held in Phoenix, Ariz., April 13 to 15 inclusive, in conjunction with the Arizona Public Health Association, the Arizona Sewage Works Association, a conference of Registrars of the Western States and Territories, and a conference of state nurses of the U. S. Public Health Service and the Children's Bureau. This was the first meeting of the Western Branch in the great Southwest, and a delightful reception was accorded the 300 registered members by the Committee on Local Arrangements. True to its name, at this time of year Phoenix arises from the burning sands of the desert, young and beautiful to glory in a brilliant health giving sun. The committee provided local atmosphere by arranging an inspection trip to points of special interest in the valley, and a barbecue supper outdoors with our hosts and hostesses wearing 10 gallon hats, colorful silk shirts and shirtwaists, riding boots, and spurs. Judging from the difficulties encountered by the Local Committee in getting programs printed and finding meeting rooms, Phoenix is rather disdainful of convention meetings, an attitude hardly in keeping with its reputation as a health resort. Despite these backstage troubles, Western Branch

members felt that they were accorded a hearty, sincere, Western brand of hospitality.

H. E. Young, M.D., Health Officer of British Columbia, venerable and revered Dean of the western state and provincial health officers now remaining in active service, presided at the opening session, the annual dinner, and all business sessions. He was at his best at the dinner. Old in service but young in ideas and future vision, Dr. Young stated:

> The future holds great promise for the Western Branch. It now encompasses 3 provinces of Canada, 11 western states, the Territory of Hawaii, and the Territory of Alaska. It is in these areas that public health advances will be most marked in the immediate future. In these areas we encounter several unique public health problems. It is in the West that public health personnel will be greatly augmented in the years to come. Let us continue to join together for purposes of mutual exchange of experience and ideas, for keeping in closer touch with our eastern colleagues, for welcoming our younger colleagues into the fraternity of public health and helping to make their path a little smoother, and for building public opinion to the point where it will support adequate public health programs in the West.

This meeting attracted more national authorities than heretofore. There was an interesting paper on public health problems encountered by cities entertaining conventions, an important contribution on the actual technics of using the radio for public health purposes, a helpful paper bearing the authority of the U. S. Public Health Service on planning venereal disease programs in local health units, a public health challenge presented by the newer methods of pneumonia diagnosis and treatment of special interest in Arizona where the death rate is among the highest, an interesting discussion of resident allocation of death reports indicating a sympathetic and helpful attitude by the Bureau of the Census, a stimulating and thought provoking paper on the application of the newer principles of mental hygiene to health department activities, an authoritative and informative discussion on industrial tuberculosis of special interest to the mining industries of the Southwest, an excellent suggestion concerning the need for a central clearing house for public health legislation, a timely paper concerning the responsibilities of public health nurses under the expanding Social Security program, and many others of equal note.

Among the items lending local color to the program was a discussion and demonstration of the Burr cottage for the home treatment of tuberculosis where no sanatorium is available, a description and demonstration of the Arizona Healthmobile, consisting of an automobile trailer with complete X-ray equipment and facilities for tuberculin testing. There was good attendance from the Indian Medical Service of the Southwest, and an interesting paper was presented concerning coöperation between the Indian Service and the local health department.

The Western Branch now has 688 Active Members and Fellows on its rolls, the largest number ever recorded in the West.

New officers elected were as follows:

President, Platt W. Covington, M.D., Salt Lake City, Utah
President-elect, Guy S. Millberry, D.D.S., San Francisco, Calif.
Vice-President, G. F. Amyot, M.D., D.P.H., Vancouver, B. C.
Vice-President, Lewis H. Howard, M.D., Tucson, Ariz.
Vice-President, Olive Whitlock, R.N., Portland, Ore.
Secretary, W. P. Shepard, M.D., San Francisco, Calif.
Treasurer, W. F. Higby, San Francisco, Calif.

New Regional Board members elected for a term of 2 years were: Malcolm R. Bow, M.D., C. J. Gillespie, Paul M. Fox, I. O. Church, M.D., and Jane Rider. Elected for 1 year: S. M. Creswell, M.D.

Dr. Church, Health Officer of Alameda County, Oakland, Calif., was elected *Chairman of the Executive Committee.* The next meeting will be held in Portland, Ore., late in May or early in June, 1938. Next year marks the 35th anniversary of the founding of the Oregon State Board of Health.

See August Journal for:

Western Branch A.P.H.A. Papers by Karl F. Meyer, Ph.D., M.D., Allan Blanchard, and James A. Tobey, Dr.P.H.

Also

How Much Control of Tuberculosis?

By W. H. Frost, M.D.

The Supervising Nurse

By J. Rosslyn Earp, Dr.P.H.

Also

PRELIMINARY PROGRAM, 66TH ANNUAL MEETING

Letter from Great Britain

LONDON COUNTY COUNCIL MEDICAL SUPPLEMENT

The collection of papers and reports on medical subjects by members of the hospital staffs of the London County Council which makes up one of the parts of the Annual Report of that body, contains matter of interest and importance to physicians and health officers in general and everywhere. This is my excuse for making reference to certain of the more outstanding contributions. The range of subjects dealt with is very wide; naturally, since the hospital service covers a great variety of institutions. Amongst these are what are described as "special hospitals," which include, in addition to a number of infectious disease hospitals, sanatoria and hospitals for tuberculosis, hospitals for treatment of venereal disease, for the treatment of diseases of the ear, for skin diseases, etc. Further, there are special units situated in special or general hospitals for, amongst other conditions, puerperal fever, radiotherapy, congenital syphilis, and arthritis, with clinics for diabetes and goitre. From each of these and from the officer in charge of the maternity operations of the Council, there come special reports or communications. In addition, there are papers on cases of exceptional interest from the general hospitals, such as agranulocytosis, idiopathic steatorrhoea and so on, all helping to make of the report quite a useful informative addition to the medical literature published in the year reported upon.

A REPORT OF DIPHTHERIA

In the reports classed as from isolation hospitals, there are references to work done in relation to diphtheria, cerebrospinal fever, acute poliomyelitis, scarlet fever, and whooping cough. Speaking generally, diphtheria in the year under review appears to have been of a mild type. Hospital case mortality rates varied from 1.5 to 3.9 per cent. Again, as in so many reports, not only from London but elsewhere, strong insistence is made of the fact that in nearly every case in which death supervened, specific treatment was not applied "until the disease was so far advanced as to make antitoxic therapy virtually hopeless. Irreparable and lethal damage," in fact, "had occurred before the patient was admitted to hospital." That there was a low incidence of laryngeal diphtheria is noted. In the discussion on methods of treatment, it is mentioned that glucose in concentrated solution given by the intravenous route has been in general use. Amongst investigations at various of the hospitals, that made with the object of determining as to the existence or otherwise of vitamin C deficiency in this disease are worth mentioning, even though all the report has to say is that the results are incomplete, but sufficient has been done to demonstrate that there is a definite deficiency in diphtheria. This is important since, judging from experiments on guinea pigs, deficiency of vitamin C indicates a lowered resistance to diphtheria toxin.

SCARLET FEVER INVESTIGATIONS

The scarlet fever report contains discussion of a number of points of interest and importance; amongst them the results of serum treatment, the most suitable date for release from hos-

pital, and the Dick response in cases of scarlet fever after an average stay in hospital. In regard to the use of scarlet fever antitoxin in treatment, most of the hospitals in which it is used report favourably pointing particularly to the low incidence of important complications, such as otitis media, mastoiditis and nephritis. The duration of stay in hospital is also reduced, though, generally speaking, nowadays the tendency all the time in fever hospitals is to discharge patients very much earlier than formerly. In one hospital, out of 716 patients it was found that nearly 50 per cent were discharged within 5 weeks of admission. The investigation into the question of the Dick response after an average stay in hospital was made along lines adopted in an enquiry carried out by two American physicians. The number of cases tested—264—was exactly the same, but whereas the tests here revealed 32 (12.13 per cent) positive, and 232 (87.87 per cent) negative between the 24th and 26th day, the American observers found only 11 (4.2 per cent) positive, and 253 (95.8 per cent) negative, the day of test being 25.8.

POLIOMYELITIS AND CEREBRO-SPINAL FEVER

The note on acute poliomyelitis, which is by Dr. J. D. Rolleston (brother of Sir Humphry Rolleston, formerly Regius Professor of Physic, Cambridge and a past president of the Royal College of Physicians) deals with 156 cases admitted to the hospitals between 1st September, 1927, and 31st December, 1935. Only in 104 was the diagnosis of poliomyelitis confirmed, which suggests that London, at any rate, escaped very lightly and was fortunate so far as this disease was concerned. Dr. Rolleston analyses the cases very closely, indicating the parts affected, the treatment adopted, and the final results. As is commonly the case, in the majority of cases the legs were the parts attacked, the diaphragm being involved in 4 cases only. Deaths numbered 4. So far as treatment is concerned, in the cases in which convalescent serum was given, no demonstrable benefit resulted. A Drinker apparatus installed in 1935 was used in 3 cases of acute poliomyelitis with diaphragmatic paralysis; 2 recovered and 1 died. In the report on cerebro-spinal fever, the question of serum treatment is discussed. Of the 25 cases regarded as amenable to this form of treatment and given various types of serum, 16 recovered and 9 died.

TUBERCULOSIS IN LONDON

Of papers on tuberculosis there are 5. In one of these there is a description of the development of the scheme for dealing with this disease in London, and more particularly, the provision made by the London County Council for the treatment of pulmonary cases in sanatoria and hospitals, and for linking up the various agencies engaged in tuberculosis work in the Metropolis, so that each and all may operate at their greatest efficiency. Broadly speaking, in London the County Council is responsible for providing institutional treatment in sanatoria and hospitals of their own or in private establishments. The Borough Councils have the duty imposed upon them of making provision of dispensaries and carrying out domiciliary treatment and preventive measures locally. Other noteworthy contributions on tuberculosis have reference to treatment, the chief medical superintendent of this service, writing on the present position of the treatment of pulmonary tuberculosis and praising the work done at village settlements, such as Papworth, and colonies such as Preston Hall. Included also are notes on recent ad-

vances in the surgical treatment of pulmonary tuberculosis, and of treatment for tuberculosis of the larynx. That the writer of the communication on the latter finds himself able to speak most hopefully with regard to the progress made and to anticipate even greater advances in the future, is most heartening.

VENEREAL DISEASE IN WOMEN AND CHILDREN

In relation to the venereal diseases (and mention of these gives me an opportunity of noting that, thanks to the efforts of those who publish reviews of news, the man in the street here has almost as full a grasp of Dr. Parran's ideas and plans as his opposite number in the United States), there are two communications worthy of attention. One has reference to activities at a special hospital provided for the treatment of venereal diseases in women (almost the most necessary and the most pathetic of all the institutions), the other being a report on the work done at a congenital syphilis unit situated at one of the general hospitals of the Council. In the hospital for women there are two blocks, in one of which there are 50 beds and 4 cots, and in the other, the maternity block, 30 beds with 2 labour beds and 16 cots. The admissions to the hospital during 1935 were the highest in any year since 1920—adults, 369, and infants, 18. Of the 369 women, 228 were suffering from gonorrhoea, 57 from syphilis, and 72 from both. The age of the patients varies from 16 to the middle 40's. They come from all classes, but are mainly working girls, and street girls, some being married women. Many of them are difficult to deal with: they are "childish in many ways; they are hypersensitive and easily upset by trifles; and often they may even be on the look-out for some reason to grumble." Nursing is not easy. It is noted that, in addition to training generally and in the special technique of treatment, "the successful nurse must be able to practise a high degree of reticence, strict impartiality (a gossiper cannot retain the respect of these girls), and control of temper under the most trying circumstances." Very much of this note contains reference to administrative matters, what is said upon occupational therapy, and the difficulties associated with providing employment and entertainment for the patients as the patients' health improves, being particularly useful. The congenital syphilis unit has only been running properly since May, 1934, and only a comparatively small number of cases has been dealt with. In these, the best results have been obtained in cases brought early, the reporter expressing regret that so few of the admissions are of infants under 2 or 3 months. Even more strongly he regrets that it does not seem to be sufficiently widely grasped that the very best results, so far as the babies are concerned, would be obtained by the appropriate treatment of the syphilis in their mothers as early as possible in the pregnancy.

RADIUM IN UTERINE CANCER

Other special units reported upon at which valuable work is being done, are those at which puerperal fever is dealt with; that at which radium treatment for carcinoma of the uterus is undertaken, and those for such conditions as goitre, diabetes, and arthritis. The note from the Radium Center is by Sir Comyns Berkeley, Chairman of the Central Midwives Board. The note throughout—as any who know Sir Comyns would expect—is one of optimism, slightly tinged with caution though it be. Generally, his promise is that the results of treatment will be

excellent if it is begun early enough, and not without hope, even though the stage be a little late. That there is need for much more propaganda than is now undertaken he is convinced, and he longs to see more post-natal centres established, and more leaflets distributed amongst the women attending them, giving information about the monthly periods, and stressing the great importance of consulting a doctor about any irregularity. The need for internal examination he stresses also, and points out that in his view "the three disgraces associated with cancer of the uterus are: Delay—Fear—Ignorance." A very impressive paper this, and one from which I should like to make many more quotations. As a fact, there are many papers in the report that contain matter worth quoting if space permitted any more than merely a note to this effect, and a word commending the report to the consideration of colleagues in the health service in the United States. A word here of commendation to those who produced the report, and arranged for and allowed its publication, may perhaps be permitted also. CHARLES PORTER, M.D.

PUBLIC HEALTH EDUCATION*

Health Education in U. S. Public Health Service

— In *The Health Officer* (May, 1937) Dr. R. R. Spencer reports on "Health Education Activities of the U. S. Public Health Service":

The United States Public Health Service has perhaps never taken full advantage of its opportunities to disseminate authoritative health information. However, about a year ago an Office of Public Health Education was established in the Division of Scientific Research on a very modest scale with an annual appropriation of only $6,000. Later this office was transferred to the Division of Sanitary Reports and Statistics.

To this latter division has fallen the lot, heretofore, of handling the greater part of all publicity, press relations, and the answering of numerous questions that come to the Service unsolicited from the general public. In addition it has prepared over a period of some years, moving picture films, special exhibits, posters, pamphlets, and radio-health talks for the public. These activities have served a very useful purpose but lack of funds and personnel have prevented further expansion. At the same time, other divisions of the Service, such as the Division of Venereal Diseases, have as a rule independently conducted their own educational campaigns, as the need arose, and as funds were available. Indeed, education is of necessity an integral part of all Service activities.

Nevertheless, up to the present time our efforts in health education have been rather desultory and sporadic. No clear-cut policy has yet been formulated. In fact, we have considered the activities of the Office of Health Education during the past year as purely experimental. So far we have ventured into 3 distinct fields:

First, the collecting and organizing of pertinent health information from 75 monthly or weekly periodicals and a dozen or more public documents and annual reports. As far as we are aware no one has systematically collected the vast uncoördinated mass of source material published by foundations, by national, state, and municipal agencies, annual reports of hospitals, government bureaus, and other bulletins covering the general field of health and human welfare.

Already we have found this material unusually valuable, and as time goes on the accumulated data will grow in value. Upon request it is passed out to officers of the Service who wish to prepare papers, to other government bureaus and independent establishments which desire bibliographies in the various health fields and to private citizens and business firms who request specific health information. . . .

We believe our office has created a situation in which health and welfare agencies will always look to us for authoritative health information and as a clearing-house in matters of health education.

Our Second experiment has been the publication of a monthly bulletin, *The Health Officer.* Its circulation is limited to state, municipal, district, and county health officers and members of their staffs, commissioned officers of the Public Health Service, departments of hygiene and preventive medicine in medical schools, and to certain welfare agencies.

Although no efforts have been made to increase its circulation, the mailing list has doubled within the first year. *The Health Officer* is largely a publication by and for health officers, and its purpose is to keep the public health personnel throughout the country abreast of the times and to serve as a unifying medium of exchange. Highly technical articles are not acceptable, but our aim is rather to give newsy and useful health facts presented in a semi-popular and entertaining style. . . .

At the present time, only 3 states, Alabama, New York, and Mississippi, have asked that *The Health Officer* be sent to all of their county or district health departments, thus taking full advantage of this publication. Upon request, any health unit will be placed on our mailing list, within the limits of our allotted circulation, which at present is only 2,000 copies. Our circula-

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

tion, however, can be increased as the need arises, with the approval of the Surgeon General.

We have been compelled to turn down applications for copies from private physicians. If we honored all requests or solicited subscriptions, our circulation could be easily quadrupled. . . .

Our third venture has been an expansion of the training given our own young commissioned officers. Since the inception of our office in March, 1936, two classes of officers have received training. Believing that such training has now become an essential part in the development of the Service and because of the expanding duties and obligations of a Public Health Service Officer, this course now covers a period of about 9 months. . . .

Plans for the future. At the request of the Surgeon General, Assistant Surgeon General C. E. Waller appointed a committee to study our health education activities and to submit recommendations as to just what rôle the Service should play in this field. The committee consists of Surgeon Estella Ford Warner, Senior Surgeon R. R. Spencer, and Senior Public Health Statistician Mayhew Derryberry. The committee has now submitted a brief memorandum to the Surgeon General to the effect that the general health educational work of the Service be continued under the supervision of the present committee which will make progress reports from time to time. Under this tentative agreement, it was suggested that Dr. Warner serve as liaison officer between the Service and the states as adviser in the formulation of plans in health education; that Dr. Derryberry make studies in educational methods and the evaluation of the effectiveness of such methods; and that Dr. Spencer continue the publication of *The Health Officer,* the collecting and organizing of health information, and the supervision of the instruction given the classes of commissioned officers.

Surely all state and local health departments should receive *The Health Officer.* We suggest that urgent requests for a place on the mailing list be addressed to Surgeon General Parran.

Furthermore, since the health departments and private health agencies should be working in close harmony and in active coöperation, the full values of *The Health Officer* will be secured only when the private agencies are admitted to that mailing list.

In the May, 1937, issue will be found other material on health education.

"The Health Officer's English" is an editorial on an ever timely subject.

"Misinformation for the Public" presents the *Coronet* (March, 1937) worse than silly article on cancer.

Dr. Estella F. Warner presents "Some Observations Concerning Health Education Programs in State Health Departments." Most significant seems to be the lack of "programs" and the widespread lack of discrimination in the selection of materials for adult health education.

"The Detective of Science" is a 15 minute radio drama "based on an actual typhoid outbreak" in 1931.

Under "Abstracts and Annotations" see "Proposed Program for the Education of Women in Regard to Venereal Disease" (Paris).

"News Briefs" tells about a series of Sunday magazine feature articles on the National Institute of Health; newspaper editorial comment on needless diphtheria deaths; radio discussions of syphilis and gonorrhea in Oklahoma City; and "Science and Modern Medicine," a talking film used in a local syphilis campaign in Greensboro, N. C.

Hygeia, June, 1937—*Hygeia,* 535 N. Dearborn St., Chicago, Ill., for June, 1937 (*25 cents*) offers the following:

The doctors assemble (significance of medical conventions) . . . Nursing waterlogged America (Red Cross flood service) . . . Health notes for the woman of forty . . . Gonorrhea (enlightened public consciousness and coöperation) . . . Eyeglass mirrors of the era (styles, superstitions, foibles) . . . The evolution of spectacles (pictures and text) . . . Hot weather hazards . . . Vacation don'ts for children . . . Shall our child go to a summer camp? . . . Medical aspects in Apicius ("who lived to eat under Tiberius") . . . Medicine in the 17th century (pictures) . . . Office hours (a play) . . . The contrast in a hundred years . . . Nature's G-men (skunks and other animals)

. . . The laboratory guinea-pig . . . Schistosomiases . . . The doctor in England . . . On walking into the hospital with malaria (why go to a hospital) . . . Questions and answers . . . New books on health.

In "School and Health":

Why adolescents go wrong . . . Teacher and nurse coöperate in a guidance program . . . Looking forward to the vacation (safety) . . . A usable health record device for schools (Grotiot, Ohio) . . . Injecting interest into health lessons (Bovina Center, N. Y.).

1937 Awards—Annually the Social Work Publicity Council makes awards for "distinguished interpretation" in the fields of health and social welfare.

In its *News Bulletin* (May, 1937) citations are offered on three projects in health.

To the Onondaga Medical Society, Syracuse, N. Y., for a maternal welfare campaign.

To the United Hospital Fund of New York for "80% of the People," a money raising campaign pamphlet.

To Henry Street Visiting Nurse Service, New York, N. Y., for a money raising campaign booklet.

National Education Association—At Denver meeting of the National Education Association in June, 1937, the American Physical Education Association, if all went according to plan, was merged with the present Department of School Health and Physical Education under the name of the American Association of Health and Physical Education, a Department of the National Education Association. The organization of a Division of Health in this new department offers an opportunity for all who are concerned with or interested in any type of school health activities to participate actively in the plans for and in the development of this reorganized department of the National Education Association.

The advance notice of the meeting stated that films, prepared radio talks, and other classroom aids for teaching health would be exhibited.

Inquiries about the new division may be addressed to Anne Whitney, School Health Education Service, National Education Association, 1201 16th St. N. W., Washington, D. C.

Health Education in England—A national health campaign intended to "publicise the health services of local authorities and to encourage the use of such services" will continue in England from October, 1937, through March, 1938, is announced in *Public Health*, official publication of the Society of the Medical Officers of Health.

The Society long ago pointed out that the best results could not be obtained from public health schemes without securing the understanding coöperation of the public. The object of the proposed campaign is to see that the health services already provided by local authorities are used to capacity. The campaign will be directed from the Ministry of Health, and the principal cost (including that for such printed materials as posters and leaflets) will be borne by His Majesty's Government.

Home Demonstration Against Pneumonia—As reported in *Health News* (State Department of Health, Albany, N. Y. May 3, 1937):

A committee of home demonstration agents representing 50 counties of the state has voted to undertake, as far as facilities permit, the inclusion of pneumonia control education in their plans for the coming year.

This action followed the recent annual meeting of home demonstration agents at the College of Home Economics, Cornell University, Ithaca, when Odessa Dow, agent for Franklin County, read a report of the experimental educational program on pneumonia control conducted in that county during the past winter under the auspices of the Home Bureau. The success of the program, the interest it aroused, and the means it provided for reaching a large group of responsible women with selected and well balanced information resulted in the appointment of a special committee to consider the further development of this work. . . .

Recommendations were adopted and sent out to home demonstration agents in 50 counties where home bureau work is organized for a total of 25,000 women, most of whom live in rural communities. In the interest of efficient and unified effort, the closest possible coöperation with county medical societies as well as with district or county health officers was advised in the development of plans.

The above is an example of wholesale coöperation awaiting cultivation by the alert, and informed state health agency.

Making Use of Libraries—The library is one of the less developed channels for spreading health information. A volunteer committee may be the chief medium for developing the library field—public, school, lending, club, and other special libraries.

For some aspects of library coöperation see "Libraries and Tuberculosis," by I. L. Towner, in *Bulletin*, National Tuberculosis Association, 50 W. 50th St., New York, N. Y. May, 1937.

Helped by the depression, the public library has discovered that it is not merely a place to dispense books, fiction and non-fiction, but also one of the main institutions for adult education. The pamphlet file, containing as it does the latest information on various subjects of timely interest, has come into its own, so the associations that have pamphlet literature to distribute will do well to get in touch with the public librarians in the neighborhood which they serve. There, in the majority of cases, willing collaborators will be found, who by means of bulletin boards, exhibits in windows and cases, and other forms of library publicity will help to bring the news about tuberculosis to the attention of the people by whom it is needed and for whom the pamphlets have been prepared. The city and town libraries are not the only ones that can be helpful. County libraries by means of traveling libraries, in packages or in bookmobiles, carry to remote rural areas books and pamphlets for the use of those who otherwise would have little access to publications of any kind.

The state libraries are also interested in library extension work and many of them also have traveling libraries. In the states in which the state libraries may not be active there are library commissions which are always interested in any promotional work. Two of these that have given especially good service are in New Jersey and Louisiana but there are many others. In some cases the library of the state department of health or the state department of education will be glad to receive pamphlet literature for use with the public.

Not only in the public library but also in the school libraries coöperation may be found. With the new plans in education, the project method, the unit plan and other progressive procedures the library has in many places become the very heart of the school. Even where such activities are not carried on the school library plays a very important part in the school day. Many will remember a school library as either a dusty collection of dog-eared books in a dark corner of the room or a place where the older pupils were allowed to study, supposedly away from the distraction of the study hall, but more often as a place where notes could be passed and conversation indulged in. All that is changed now and in the school library, presided over by a competent and well trained teacher-librarian, may be found up-to-date material for the use of pupils in the units or projects that are being worked out in class.

Health Education in Journal for May, 1937—Of interest to health educators in *American Journal of Public Health:*

In "Obstacles and Aids to Communicable Disease Nursing," by Haupt, is a paragraph (page 436) on the educational functions of the nurse; a day's work, much of it educational (page 436); and one of five aids in saving many lives (page 438):

Better understanding of the whole service of public health nursing in this field on the part of physicians, health officers, school personnel, industries, and the lay public.

"Recent progress in Health Education," by Shepard (page 454), something for all to read.

"Appraising the Educational Content of a Health Service Program," by Palmer and Derryberry (page 476), is for all who have to do with schools.

"Tests and Promotion of Registration of Births and Deaths," by Deacon (page 494), explains how publicity is badly timed if it is put on when registration is being checked for accuracy.

In "The Use of Lay Boards by Official Health Agencies," by Peterson, find description of functions of such bodies in a nursing agency (page 500):

> The third function of the committee is to interpret the service to the community and guide the nurse in developing that service. This, of course, does not mean that a lay committee advises regarding nursing technic, rather, they help decide how to make most effective for their community a program in conformity with well established practices in the field of public health.

In "Books and Reports" see review (page 533) of "Annual Report of the Surgeon General," a volume for all public health workers who can get hold of a copy.

And be sure to read the review (page 534) of "Get It Right!"

Health Conservation Contest awards are listed on page 542.

Summer school courses in public health are announced on pages 546–550.

WANTED

If you can answer this one please write to Adele E. Yoé, Department of Public Health, Louisville, Ky.:

> Do you have any bulletin or pamphlet about health education or industrial hygiene?

If you can tell of any health plays for adults please tell Dr. C. F. Bolduan, Department of Health, New York, N. Y.

BOOKS RECEIVED

HOW THE PRESIDENT, THOMAS JEFFERSON, AND DOCTOR BENJAMIN WATERHOUSE ESTABLISHED VACCINATION AS A PUBLIC HEALTH PROCEDURE. By Robert H. Halsey. New York: Published by the Author, 1936. 58 pp. Price, $1.00.

TEN MILLION AMERICANS HAVE IT! By S. William Becker. Philadelphia: Lippincott, 1937. 220 pp. Price, $1.35.

THE CONTROL OF BOVINE TUBERCULOSIS IN MAN. By Nathan Raw. London: Bailliere, Tindall & Cox, 1937. 128 pp. Price, $2.00.

PUBLIC WORKS ENGINEERS' YEARBOOK, 1937. Proceedings of American Society of Municipal Engineers International Association of Public Works Officials, Toronto, Can., Sept. 28–30, Oct. 1, 1936. Chicago: American Public Works Association, 1937. 283 pp.

MAN IN A CHEMICAL WORLD. By A. Cressy Morrison. New York: Scribner, 1937. 292 pp. Price, $3.00.

THE MENTALLY ILL IN AMERICA: A HISTORY OF THEIR CARE AND TREATMENT FROM COLONIAL TIMES. By Albert Deutsch. Garden City: Doubleday, 1937. 530 pp. Price, $3.00.

GETTING READY TO BE A MOTHER. By Carolyn Conant Van Blarcom. 3d ed. New York: Macmillan, 1937. 305 pp. Price, $2.00.

PSYCHIATRIC SOCIAL SERVICE IN A CHILDREN'S HOSPITAL. By Ruth M. Gartland. Chicago: University of Chicago Press, 1937. 105 pp. Price, $1.25.

PHYSICIANS AND MEDICAL CARE. By Esther Lucile Brown. New York: Russell Sage Foundation, 1937. 202 pp. Price, $.75.

YOUTH SERVING ORGANIZATIONS. National Non-Governmental Associations. By M. M. Chambers. Washington: The American Council on Education, 1937. 327 pp.

FLUORINE INTOXICATION: A CLINICAL-HYGIENIC STUDY (With a Review of the Literature and Some Experimental Investigations). By Kaj Roholm. London: Lewis, 1937. 364 pp.

TECHNIQUE OF UNDERWATER GYMNASTICS. By Charles Leroy Lowman. Los Angeles: American Publications, Inc., 1937. 276 pp. Price, $5.00.

MANUAL OF PUBLIC HEALTH BACTERIOLOGY. Issued under direction of the Department of Public Health, San Francisco, Calif.—Dr. J. C. Geiger, Director. San Francisco: Stacey, 1937. 141 pp. Price, $1.50.

MATERNAL CARE. By Dr. Fred L. Adair, Editor. Chicago: University of Chicago, 1937. 93 pp. Price, cloth, $1.00, paper, $.25.

BOOKS AND REPORTS

A Woman Surgeon—*By Rosalie Slaughter Morton. New York: Stokes,* 1937. 399 pp. Price, $3.00.

It is given to few men and to still fewer women to lead a life of such adventure and service as is recorded in this autobiography. One involuntarily looks for the source of the stamina and determination which led this young girl to break with her traditions to such an extent as to study medicine and to follow her profession in various parts of the world with such amazing success as to win high honors, no less than eight decorations for distinguished service having been bestowed upon her. We find the key to her character on both sides. On her Father's side, since 1620, when her ancestors settled in Virginia, 17 direct and 52 collateral descendants have studied medicine. The Mother was a Quaker, of Mount Holly, N. J., a sect noted for its steadfastness and humanity and to which we owe such men, among others, as Lord Lister, Lettson, and Hodgkins.

Dr. Morton (then Rosalie Slaughter) graduated from the Woman's College of Philadelphia, founded in 1850 by two Quakers, which remains today the only medical school in this country exclusively for women. Postgraduate work in Berlin, Vienna, Paris, and London came after she had had some experience in practice, chiefly in dispensary work. In running over the Table of Contents we see that in India she was in the midst of an outbreak of bubonic plague; that she worked in Greenland under Dr. Grenfell; that she served abroad during the World War; was on the Salonica front and with the French Fleet of Mercy. Indeed, there are few countries of the world which she did not visit during or soon after the war. After such a busy life she is now to be found practising medicine in Winter Park, Fla.

The book must be read to be appreciated as no review can do it justice. Dr. Morton has not given her entire attention to activity. In almost every page she gives evidences of rational thinking and of having reached conclusions drawn from an eventful life. Her life story will be an inspiration to all interested in humanity and especially to the women who are now playing so large a part in our medical world.

The reviewer has had the pleasure and honor of knowing Dr. Morton for many years, an acquaintance which began during her early struggles in Philadelphia which she so graphically describes. He begs to offer her sincere congratulations on her accomplishments and to wish for her many additional years of usefulness and happiness.

MAZŸCK P. RAVENEL

Modern Principles of Ventilation and Heating—*By T. Bedford, D.Sc., Ph.D. London: H. K. Lewis & Co., Ltd.,* 1937. 85 pp. Price, $1.75.

The author has assembled 3 of his lectures given at the London School of Hygiene and Tropical Medicine under the Heath Clark Bequest to the National Institute of Industrial Psychology. Recognizing that the worker's attitude toward his job is affected by his environment it is obvious that the psychologist, physiologist, and engineer meet on common ground. Each

is intimately concerned with the problems of heating and ventilation.

Basic principles of the whole rather than technical details are discussed. Much of the research work described was done by the author and his colleagues in the Industrial Health Research Board, although recognition is given to others. The volume is of special concern to public health officers and all others interested in the subject.

The contents comprise 8 chapters: A brief historical account of heating and ventilation, modern methods, a discussion of warmth and comfort, the causes of discomfort, stimulating environments, work at high temperatures, and the influence of atmospheric conditions on accident frequency and sickness. A bibliography and index accompany.

This work by an outstanding authority will undoubtedly have a wide reception in this country and on the Continent. Its brevity of statement, yet comprehensive coverage, commend it especially to the busy reader.

EMERY R. HAYHURST

Rural Health Practice—*By Harry S. Mustard, M.D. New York: The Commonwealth Fund,* 1936. 620 pp. Price, $4.00.

Rural Health Practice is a fitting sequel to *Introduction to Public Health.* The latter was an analysis of public health problems in skeletal outline form. *Rural Health Practice* clothes the skeleton with form and symmetry. The reader having his problem clearly defined, is shown the practical ways and means of rounding out and conducting his program in such a way as to endow it with common sense and humanity rendering it closely akin to an organic personality.

I have used the word "sequel" knowing that this word is applied most commonly to novels or continued stories. *Rural Health Practice* is not only a continuation of the thought contained in *Introduction to Public Health,* but it is written in such a charming style as to be readable in the same sense as a novel. It is characterized by clear expression, familiar diction, and an easy style seasoned with wit and good humor, so that from start to finish there is not a dull moment.

The book has been written by one who knows in a very intimate way the everyday problems of the rural health worker. It is not a bookish adaptation of city health practice to rural conditions. Stereotyped theory and dogma are conspicuous for their absence. Candid treatment of the practical problems of rural health work from the standpoint of personal experience, and common sense exposure of rural health fallacies, flash from every page.

The author is clever in his handling of controversial issues and usually careful to refrain from a partisan position. His method is to present all sides of a question, leaving the reader to draw his own conclusions.

Every chapter makes an essential contribution so that it is difficult to commend one more than another. Certain items merit special commendation, as the chapter having to do with the internal organization of state health departments, and particularly that function concerned with the supervision of local health service. The author advises against the very common tendency to the creation of a multiplicity of bureaus, and suggests a logical and workable plan of organization. His discussion of the supervision of local health work is of monumental importance. It is only by adherence to the principles emphasized that complete harmony and the highest efficiency can be secured. Not

only every state health officer who has to do with the supervision of local health work, but every bureau chief should saturate his very soul with the policies and plans stressed in this connection. This chapter alone is well worth the price of the book.

The second item which stands out pertains to the internal management of the local health program and is discussed under allocation of program time, and sequence in development of the program. These titles, put into a single term, signify relative values. A sense of relative values is essential to the orientation and orderly development of any program, and determines the strategy that must be employed in carrying out a program with limited forces, a situation with which practically every health administrator has to deal. In certain public health circles there has been observed a deplorable tendency to flout the balanced public health program. Occasions arise wherein it is wise to emphasize some certain objective out of proportion to others for the time being, but this should not discount the fundamental importance of proper weighting of the various activities with corresponding emphasis upon each problem.

This review is not meant as an unqualified eulogy. Not a few of the author's views and conclusions are debatable; some with which I personally frankly disagree. There are certain deficiencies to be noted, especially in the field of sanitation. Nothing is said on the subject of mosquito control, fly control, rodent control, food sanitation, and certain other sanitary measures that may be concerned with the protection of rural health. The book as a whole, however, is so overwhelmingly sound, sensible, practical, and reliable that any thought of criticism fades into insignificance. My general reaction can be summed up in no more expressive term than to say that it should occupy the same position with respect to the student and practitioner of rural health as does Osler's *Practice of Medicine* to the medical student and practicing physician. K. E. MILLER

Water Purification Control—*By Edward S. Hopkins. (2d ed.). Baltimore: Williams & Wilkins*, 1936. 184 pp. Price, $1.75.

The principles of water purification, for the purpose of guiding the water works operator in the successful control of his plant, appears to be the aim of this book.

Each process employed in present water purification practice is considered in a separate chapter: coagulation, sedimentation, filtration, disinfection, taste and odor control, etc. Numerous operating difficulties that have been encountered in all of these, whether used alone or in various combinations, are mentioned. With a precision and simplicity of terminology, definite suggestions for successfully overcoming these problems are given. The value of these suggestions is strengthened by references to specific cases. This edition also contains a chapter explaining modern water softening methods.

While technical explanations and chemical formulae have been omitted, the excellence of the choice of references to current literature is such that a conscientious water works operator will find this volume a valuable book of reference. F. J. MAIER

Annual Report, Division of Public Health, Idaho, 1936. *Boise, Idaho.* 72 pp., mimeographed.

This report marks the first year of a full-time state health organization and therefore is a milestone in the public health progress of the State of Idaho. Public health administrators will recognize a commendable record of progress

in this short space of time in the development of a central program of supervision and technical assistance coupled with the formation of 4 whole-time county health units and of 7 additional county organizations provided with minimum whole-time nursing service. The Public Health Adviser, upon assuming office as full-time director of health services, in December, 1935, derived benefit in the initial planning of the new program from a health survey made three years previously by a Surgeon of the U. S. Public Health Service. State and local funds were supplemented by grants-in-aid made possible by the Social Security Act, and by the Rockefeller Foundation. Twenty-five persons received special training for a period of 3 months while 5 nurses, 3 physicians, and a sanitary officer attended schools of public health during the year.

Efforts have been made to stimulate the reporting of communicable diseases. With financial and technical assistance of the U. S. Public Health Service, a survey of the possible existence of bubonic plague in ground squirrels and other small animals was instituted. The presence of this infection was proved in sections of Eastern Idaho, and eradication measures were instituted in the infected areas through the coöperation of the U. S. Biological Survey and Works Progress Administration.

Since plague has been demonstrated during the past season in neighboring states, and because one human case developed in an adjoining state where the existence of plague had heretofore been unknown, and as a further spread of this infection is a great hazard to human life and more difficult of control when widely scattered, intensive efforts will continue to be made to locate foci of infection and carry on eradication measures.

Among the public health education activities are noted the preparation of a monthly bulletin distributed to physicians, schools, organizations, and individuals numbering 4,000 each month. Special lecture courses have been given in preventive medicine for the benefit of practising physicians, and educational activities have been promoted in dental health, in care of crippled children, and maternity and child hygiene.

IRA V. HISCOCK

The Joy Family—Malden Health Series—*By C. E. Turner, Dr.P.H., Alice L. Beckwith, Nell Josephine Morgan, R.N. (ill.) Boston: Heath,* 1936. 130 pp. Price, $.58.

The authors have planned a reader to serve as the basis for developing a health project in the classroom and it has been written on the second grade reading vocabulary level. The book, generously illustrated in color and also in black and white, offers many pleasant stories of adventures and everyday experiences in the life of the Joy children. Little second graders will like it.

ANNA B. TOWSE

Roads to Health and Happiness—*By Oscar C. Mueller. New York: Prentice-Hall,* 1936. 137 pp. Price, $2.00.

The author, a lawyer, has attempted to produce a brief health text for laymen. While interestingly written, its short paragraphs make sustained attention difficult. Some of the statements made are not in accordance with the facts. It presents the case for the moderate use of alcohol in a more favorable light than modern physiological research seems to justify.

CHARLES H. KEENE

Guide Book for Mothers—*By Allan Roy Dafoe, O.B.E., M.D. New York: Julian Messner, Inc.,* 1936. 256 pp. Price, $1.50.

To anyone who has had the privilege of personally seeing the Dionne quintuplets this book will come as a wel-

comed volume in child care. It will appeal to mothers—and even fathers—everywhere as coming from the doctor who has had most intimate knowledge of the rearing of these remarkable children. Dr. Dafoe gives due credit to the distinguished specialists whose scientific work contributed largely to the saving of the 5 babies' lives in the early months. His own skill, however, and the common sense and ingenuity used daily in the application of modern pediatric methods stand out in simple, direct statements on every page. Dr. Dafoe begins at the beginning, stressing the importance of prenatal care. He follows step by step the detailed procedures necessary to keep a baby well and to assure normal growth and development. A very timely and instructive chapter on safeguards for the premature infant is included.

The book is written in a delightful, personal style and is replete with practical suggestions. His "creed for mothers and fathers" should be framed in every home. We may not agree with the author in the size of families he recommends but mothers cannot help but profit by the practical advice and directions given. The publishers have certainly put out the book in very attractive covers and format.

RICHARD A. BOLT

Ortshygiene: Wasserversorgung, Abwässerbeseitigung, Beseitigung der festen Abfallstoffe, Wohnungs- und Siedlungswesen—*By Hans Lehmann; "Bäder und Kurorte"—By H. Vogt. Vol. 6 of Series "Gütt und Moebius: Handbücherei für den Öffentlichen Gesundheitsdienst." Berlin: Carl Heymanns Verlag,* 1936. 247 pp. Price, Marks 13.

The authors of this 6th volume of an extensive treatise on public hygiene, edited by Gütt and Moebius, are the directors, respectively, of the official bureaus dealing, in the one case, with water supplies, sewage disposal, industrial wastes, dwellings, and sites, and in the other, with public establishments affording medicinal baths and waters. The book, therefore, is the source for the latest information on German regulations and practice in these basic fields of public health.

The subjects treated by Lehmann include the origins, sources, procurement, and qualifications as to hardness, iron and manganese content, and corrosive potentialities of waters for potable and industrial uses. Another section deals with the physical, physiological, chemical, bacteriological, and biological examination of water. This treatment is well rounded out in all fields with two exceptions. In the directions for water sampling, insufficient recognition is given to the effect, especially in reservoirs, of the biological factors which differ in their incidence with the location, level, time of day, season, and age of the sample. The necessity of taking a complete vertical sample thoroughly mixed before the withdrawal of the smaller sample for analysis is not indicated. In the second place, the significance of the biological aspects and the place of supply of bath water and of sewage disposal are not so adequately apprehended nor presented as are the chemical. The chlorine treatment for destruction of bacteria in water supplies is the only one discussed.

The section on sewage disposal deals with various mechanical and biological methods of ridding sewage of its offensive load and with the special problems peculiar to various types of industrial wastes. Other sections are concerned with garbage disposal and with regulations concerning adequate protection of health in dwellings with reference to moisture, heating, lighting, ventilation, room size, and sanitary equipment.

Vogt's section is devoted to the medical and sanitary aspects of the supervision and regulation of public and private establishments, which utilize the natural resources of thermal and mineral springs, high altitudes, etc., for sanatoria providing curative and preventive medical treatment.

CHARLES A. KOFOID

Occupational Hazards and the Painter—*By Adolph B. Gersh. New York: District Council No. 9, B. of P. D. & P. of A.* (253 W. 28th St.), 1937. Paper, 99 pp. Price, $.54.

This bulletin, from labor's source, is written with special reference to New York, the author being director of the Extension Division of the Building and Allied Trades Compensation Service Bureau, and a member of the Compensation Committee, New York State Federation of Labor. There is a foreword by Louis Weinstock, secretary-treasurer of the local painters' union concerned, which has been seriously attempting to determine and eliminate industrial hazards.

The study presents a picture of the major hazards in the trade, relates this to the prevailing conditions and methods of work, and indicates some of the compensation problems. It is chiefly a result of an analysis of the compensation files of 646 injured painters, based upon a history of each case and the official reports of the New York Labor Department. Of these cases, 505 were closed and 141 open, as regards compensation. Most of the data are based upon the closed cases.

There are 5 chapters: The Evolution of the Painting Trade (5 pp.), The Causes of Accidents (15 pp.), Occupational Diseases (27 pp.), The Cost of Industrial Hazards (21 pp.), and Administrative Problems (22 pp.). There is no index but the Table of Contents is competently sub-headed. There are 21 figures and charts and 3 administrative forms. Under "Occupational Diseases" are cited, and sometimes abstracted, a number of studies made for this trade in more or less recent years, particularly in reference to accident statistics and poisoning. The causes of death among painters, as statistically determined by the National Tuberculosis Association (June, 1934), are emphasized, also hazards of the paint spray machine, and considerable space is devoted to studies made by the National Safety Council (Dr. Henry F. Smyth) in 1927. There is a sharp contrast between the more or less favorable conditions under which the painter may work in a factory and the widely varying conditions in the building trade.

While there are some typographical errors, and the author notes the usual shortage of certain essential data, this is an interesting study of the compensation experiences of a large local union and the economic and social significance thereof.

Not more than half a dozen health studies from labor sources have appeared in this country, and it would appear that here is a wide field for labor to "get busy" upon.

EMERY R. HAYHURST

Laboratory Outline in Filterable Viruses—*By Roscoe R. Hyde, Ph.D., with the Assistance of Raymond E. Gardner, Sc.D. New York: MacMillan,* 1937. 85 pp. Price, $1.50.

In their small volume the authors have presented brief directions "planned to give the student a *first-hand* knowledge of the *nature* and *behavior* of a number of representative viruses . . ." and "a more comprehensive experience with the *pathology* of a selected group of virus diseases ranging from necrosis to hyperplasia." The text has been evolved from labora-

tory notes used for a number of years in the teaching of courses at the School of Hygiene and Public Health, the Johns Hopkins University, where the late Charles E. Simon established the first university department on filterable viruses in the United States.

The exercises are designed as an introduction to the study of the filterable viruses. In preparing them, the choice of viruses and methods has been governed by questions of suitability for class use. They are planned with the idea that the work can be completed within the time allocated for the laboratory period. The directions are stated briefly. It follows that the student will require frequent consultation with an instructor to supply technical details. To make intelligent use of the exercises, the student must have been well grounded in general science, and must have received adequate training in bacteriology, immunology, and pathology. Thus, the volume will be most serviceable to the teacher confronted with the problem of giving a small number of well prepared students a practical introduction to the filterable viruses. For the more advanced student and the research worker, the volume will not be very helpful.

A number of technical methods are described: filtration, the preparation and use of collodion membranes, electrophoresis, tissue culture, the making and staining of histological preparations, etc. The descriptions of these methods have been gathered from many sources for the convenience of the student. The viruses selected for study exemplify a number of types. They include the viruses of Bacteriophagy, Tobacco mosaic, Lymphocystic Disease of fish, Vaccinia and Variola, Fowl-pox, Herpes, Rabies, Rous Sarcoma, Poliomyelitis, and Yellow Fever. Selected references are given with a view to guiding the student to suitable reading material for use in connection with the laboratory work. This selection is rather arbitrary and inadequate.

GEORGE PACKER BERRY

Vitamins—In Theory and Practice—*By Leslie J. Harris* (2nd ed.) *New York: Macmillan,* 1937. 242 pp. Price, $3.00.

Directed toward science students, medical men, and others interested in the vitamin question, this second edition of a book reviewed in this *Journal* in April, 1936, presents with a minimum of academic uncertainty a summary of knowledge in this field, comprising an unexpectedly complete and up-to-date wealth of detail. In fact, one might be permitted to wonder whether the combination of positive assertions of theory with minimum reference to debatable questions is entirely compatible with the completeness of detail in regard to the varied phases of "vitaminics" which is displayed in this book.

To one somewhat conversant with progress in vitamin research this book is helpful in refreshing the memory; for one seeking the facts for the first time, it should be exceedingly instructive. For data on Anaemia in Aberdeen to Xerophthalmia in Africa, a very complete index facilitates the search for the facts about vitamins as interpreted by an author whose sources of information have been exceedingly comprehensive. Forty-four tables and 66 illustrations are interspersed through the well printed and attractively arranged text. JOHN W. M. BUNKER

Dietetics Simplified—*By L. Jean Bogert, and Mame T. Porter. New York: Macmillan,* 1937. 637 pp. Ill. Price, $3.00.

This is primarily a textbook for students in home economics and die-

tetics, but it will be useful to physicians and nurses. The intelligent lay public also can turn to this book with assurance that the information it contains is authentic, complete, and understandable. The young housewife who reads it seriously can find, so far as present knowledge permits, all the information that is necessary to make the most of the food resources at her disposal. The conventional chemistry and physiology of food and metabolism have been almost entirely omitted; so the book is what the title indicates, a treatise on dietetics. As would be expected the bibliography is limited.

The first section, 95 pages, is devoted to the elementary principles of nutrition, and includes chapters on energy, protein, minerals, vitamins, water, and fiber (bulk). The second section, 118 pages, discusses the normal diet, and includes chapters on menu building, diets for various members of the family and economic and racial factors. This section is eminently practical, and is sufficiently detailed to fit any common individual requirement. Specific menus are described with as definite a statement of quantities as is practicable. The author leans definitely toward the Sherman school of thought, in the allowances for milk, fruit, and meats. There is a detailed discussion of special requirements, due to age, sex, body conformation, and occupation. The choice of foods at different income levels is given careful consideration, always with the objective of insuring a diet that is entirely adequate.

The section on Diet Therapy covers over 240 pages and includes all except the rare and obscure diseases. Again the choice of food with abundant detail as to quantities, is discussed in the most specific manner. There are also two sections on laboratory instruction, one on Lessons in Cookery, over 80 pages, and one on Diet in Disease, over 120 pages. These three sections also impress the reviewer as a competent and reliable source of information, but he hesitates to be more specific since he is not trained in those fields.

There is an appendix with Nutritive Values of Foods, Weights and Measures, and Weight Tables. The book is carefully indexed. A. G. HOGAN

Baby Epicure—*By Elena Gildersleeve. New York: Dutton,* 1937. 141 pp. Price, $1.75.

Baby Epicure purports to be a book which will make every child "critical and particular about its food and capable of enjoying a sane and varied diet." This is indeed a worth while but rather large result to expect from so small a book of recipes. The recipes are very interesting, possessing all the international flavor that their author claims. The dishes are within the nutritional possibilities of the young epicure. The running comment between recipes intrigues the imagination and so accomplishes what a more thoroughly scientific recipe book might fail to do. It stimulates the cook to make the culinary effort which is required for the true food epicure.

VICTORIA K. BALL

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

General Mortality Rates Up—If present trends continue, the time will soon come, concludes this article, when 95 per cent of new-born infants will survive the first year of life. May that forecast prove correct.

ANON. Mortality in Certain States During 1936 With Comparative Data for Recent Years. Pub. Health Rep. 52, 19:587 (May 7), 1937.

Care of Sick in New York—Under the chairmanship of Dr. George E. Vincent a committee has been engaged for 2 years on a study of the "activities, investment, and financial operations of all institutions and agencies organized for the care of the sick in that area." Committee recommendations are summarized under these categories: hospitals, nursing service in hospitals, out-patient services, ambulance service, medical social service, care of the chronic sick, convalescent care, nursing the sick in their homes, organized home medical care, control and coördination of institutions, maternity care, mental diseases, tuberculosis, syphilis and gonorrhea, cancer, heart disease, dental care, diabetes. Copies of the full reports can be obtained from the United Hospital Fund, New York City. A short summary of the recommendations is given in two references.

ANON. Sixty Improvements in Hospital Care. Mod. Hosp. 48, 5:67 (May), 1937. (Editorial) The Hospital Survey for New York. Am. J. Nurs. 37, 5:507 (May), 1937.

Why Teeth Decay—Extensive research into the cause of dental caries leads the author to the belief that it is a specific bacterial disease caused by the organism *Lactobacillus acidophilus*. This organism acting on carbohydrates in contact with the teeth forms acids which dissolve the enamel and produce a cavity. This is the only factor having any high degree of correlation with the disease that has thus far been discovered. As yet only one successful method has been found for the control of the disease and that is the elimination of sugar from the diet. In groups of children so fed, dental caries was arrested in approximately 90 per cent of the individuals. Further measures for prevention and control that have proved advantageous to the children are reported.

BUNTING, R. W. The Prevention of Dental Caries. Michigan Pub. Health Bull. 25, 5:91 (May), 1937.

For Gonorrhea—One of the factors precluding effective control of gonorrhea has been the lack of a specific treatment. In this preliminary report the authors present their excellent results with the use of sulfanilamide at Johns Hopkins.

DEES, J. E. The Use of Sulfanilamide in Gonococcic Infections. J.A.M.A. 108, 22: 1855 (May 29), 1937.

Social Case Work and the Child—This series of articles dealing with the child will be of interest to those public health workers who turn to social agencies for coöperation and who wish a better understanding of the principles which underlie such work.

GARTLAND, R. The Child, The Parent, and the Agency

COLE, L. C. The Private Children's

Agency—Its Possibilities and Limitations
GREEN, R. The Inner Significance and Outward Expression of Children's Problems
HEARSEY, M. E. Problems of the Handicapped Child: As Met by the Medical Social Worker
The Family. 18, 3:75 (May), 1937.

About Tuberculous Infections—Among 18,000 college entrants, the tuberculin test was positive in from 40 to 60 per cent of the Eastern and Far Western States, and lower (from 20 to 30 per cent) in Central States. Rates were higher among men than women.

LONG, E. R., and SEIBERT, F. B. The Incidence of Tuberculous Infection in American College Students. J.A.M.A. 108, 21:1761 (May 22), 1937.

Diphtheria Carriers—After discussing thoroughly the difficulties encountered in detecting diphtheria carriers and methods for doing so, the paper comes to the sensible conclusion "to immunize the susceptible population and stop bothering about the carrier."

MITMAN, M. The Problem of the Diphtheria Carrier. J. State Med. 45, 5:249 (May), 1937.

Safer Though Less Pleasant Deliveries—Urging less obstetrical anesthesia and more obstetric care, this article points one objective for health education: to teach prospective mothers that safety in childbirth is more important than unconsciousness produced by drugs.

MONTGOMERY, T. L. Obstetric Amnesia, Analgesia, and Anesthesia. J.A.M.A. 108, 20:1679 (May 15), 1937.

Useful in Prognostication—Charts from the records of disease reports made to the U. S. Public Health Service show characteristic seasonal incidence. Diphtheria, influenza, measles, meningitis, smallpox, typhoid fever, poliomyelitis, and scarlet fever are presented.

OLESEN, R., and HAMPTON, B. C. Seasonal Patterns and Trends of Communicable Diseases. Pub. Health Rep. 52, 19:609 (May 7), 1937.

Posing the Problem of Chronic Disease—In a northern industrial city, 1 in every 5 persons canvassed had a chronic disease, a defect of vision or hearing, or a permanent physical impairment. Greatest numbers were found in the relief population and the aged. On the day of the canvass, 1 in 10 of the unemployed heads of families were idle because of disability. Like most cities, the one surveyed had no plan for the control of chronic disease, due no doubt to lack of factual information about the situation. The survey certainly provides a basis for lively community action.

PERROTT, G. ST. J., and HOLLAND, D. F. Chronic Disease and Gross Impairments in a Northern Industrial Community. J.A.M.A. 108, 22:1876 (May 29), 1937.

Old Age Security for Professional Workers—Since the Social Security Act does not affect employees in philanthropic or educational institutions, most public health workers must cast about for other ways to care for their old age. Their attention is called to the fine type of service given by some institutions for both men and women, and to the need for planning well in advance if admission to such homes is to be secured.

RANDALL, O. A. Old-age Security at "Home." Am. J. Nurs. 37, 5:488 (May), 1937.

For Sick Babies—Cubicle isolation beds for infants are found safe, satisfactory, and practical. Wider use is urged.

SCHICK, B., and KARELITZ, S. Pirquet Cubicles for Infants. J.A.M.A. 108, 20:1684 (May 15), 1937.

The Nut on the Steering Wheel—Health officials who are asked to take

part in motor car accident prevention campaigns would do well to read this article which emphasizes the limitations of the driver testing apparatus which currently receives so much newspaper publicity.

SELLING, L. D. The Psychological Approach to the Traffic Problem. Sci. Month. June, 1937, p. 547.

Ventilation, Comfort, and Health

—Under ordinary indoor conditions artificial humidification is unnecessary, says this sound report which will enable sanitarians to keep an even keel in the face of the gales of high-pressure sales promotion by commercial air conditioners. A fine, useful committee report.

YAGLOU, C. P. Physical and Physiologic Principles of Air Conditioning. J.A.M.A. 108, 20:1708 (May 15), 1937.

ASSOCIATION NEWS

PUBLICATION DATES FOR ANNUAL MEETING INFORMATION

July	Hotels, rates, reservation blank
August	Preliminary scientific program
	Scientific Trips
	Railroad rates from principal cities
September	Entertainment Plans

NO POST-CONVENTION TOUR THIS YEAR

THE Committee on Meetings and Publications announces regretfully that the plans for the projected post-convention tour to Bermuda under the auspices of the Association have been abandoned. It is the policy of the committee to organize group travel movements only when financial arrangements can be effected which are decidedly to the advantage of members, and when unusual professional and social opportunities are offered to a delegation which an individual would be unlikely to secure for himself. Neither of these factors is inherent in the proposals entertained by the committee for a tour to Bermuda following the New York City meeting.

IDENTIFICATION CERTIFICATES NOT REQUIRED

THERE will be no identification certificates for reduced railroad rates mailed to members of the Association this year. The blanket rate of 2¢ per mile in coaches and 3¢ per mile in Pullmans adopted throughout the United States in 1936 still maintains. It is a public tariff and no organization credentials are required to obtain it. Rates from various cities to New York will be published in the August *Journal*.

HEALTH EDUCATION INSTITUTE

REQUESTS for the program of the Fifth Health Education Institute have been numerous. Registration will be closed at the discretion of the Institute Committee. Prompt action is desirable if you wish to enroll in the Institute this year. The registration fee is $3.00 for members of the Association and $6.00 for non-members.

VITAL STATISTICS HEADQUARTERS

THE Vital Statistics Section and the American Association of State Registration Executives will make their headquarters at the Hotel McAlpin. A welcoming committee will be on hand

to introduce those people who do not know each other and to provide information about the interesting things planned for vital statisticians during the days of the 66th Annual Meeting.

CLOSING DATE FOR FELLOWSHIP APPLICATIONS

THE Committee on Fellowship and Membership wishes to announce that August 1 is the closing date for accepting Fellowship applications for action at the New York City Annual Meeting. Eligible members who desire to apply for Fellowship this year are requested to submit their applications to the committee as much in advance of August 1 as possible.

ERRATUM

In the article Nutritional Economics of Dietary Calcium, by Frank L. Gunderson, Ph.D., page 572 of the June *Journal*, the sentence starting in the middle of column 1, as follows: "The cost of natural foods . . ." should be changed to read:
The cost of natural foods bearing 1 gm. of calcium varies from a low of 6.4 cents for either evaporated milk or American cheese up to more than $2 for certain other foods.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Norman L. Cook, M.D., 426 Park Ave., Waverly, N. Y., Acting Health Officer of Chemung County

Franklin L. Geiger, M.D., 320 E. Bridge St., St. Matthews, S. C., Director, District Health Dept.

Erwin R. Lochte, M.D., 1000 Medical Arts Bldg., San Antonio, Tex., Member, City Health Board

Harry D. McNeil, M.D., Department of Health, Bangor, Me., Health Officer

Howard E. Porter, City Hall, Quincy, Mass., Agent, Health Department

John J. Poutas, M.D., 145 State St., Springfield, Mass., State District Health Officer

Thomas B. Todd, M.D., Buckner Bldg., Nevada, Mo., Vernon County Health Officer

Charles R. Wylie, M.D., County Health Unit, Ventura, Calif., Ventura County Health Officer

Laboratory Section

Edward M. Butt, M.D., 3551 University Ave., Los Angeles, Calif., Bacteriologist and Pathologist for Santa Fe Railroad Hospital

George Jaggard, 2300 Locust St., Philadelphia, Pa., Manager, The Dairy Laboratories

Beatrice B. Potter, Gaylord Farm Sanatorium, Wallingford, Conn., Laboratory Worker

Charles R. Schroeder, D.V.M., New York Zoölogical Park, Bronx, N. Y., Veterinary Pathologist

Ernest C. Thompson, 1792 E. 22 St., Brooklyn, N. Y., Director of Laboratories, The Borden Co.

Vital Statistics Section

Carol C. Creighton, 1245 N. Commerce St., Stockton, Calif., Vital Statistician for San Joaquin County

Elizabeth Reed, State Dept. of Health, Albany, N. Y., Junior Statistician

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Public Health Engineering Section

Graham M. Hatch, Jr., 202 City Hall Annex, Dallas, Tex., Sanitary Engineer, Health Dept.

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Kenneth C. Lauster, 309 S. 5th St., Grand Forks, N. D., District Supervisor, Community Sanitation, State Dept. of Health

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William M. Wallace, B.S., Filtration Plant, Water Works Park, Detroit, Mich., Supt. of Filtration

Rudolph H. Weiss, 917 Water, Kerrville, Tex., District Sanitary Engineer, State Dept. of Health

Richard L. Woodward, Interstate Sanitary District No. 2, Washington, D. C., Junior Sanitary Engineer, U. S. Public Health Service

Industrial Hygiene Section

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Herbert T. Walworth, Herman Kiefer Hospital, Detroit, Mich., Chemical Engineer, Bureau of Industrial Hygiene, Dept. of Health

Food and Nutrition Section

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Hyman J. Kleinfeld, 1284 Sterling Place, Brooklyn, N. Y., Inspector of Foods, Dept. of Health

Child Hygiene Section

Clara B. Barrett, M.D., State Dept. of Health, Atlanta, Ga., Pediatrician, Child Health Demonstration

Myron E. Wegman, M.D., 2411 N. Charles St., Baltimore, Md., Pediatric Consultant, Bureau of Child Hygiene, State Dept. of Health

Public Health Education Section

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Frances R. Pratt, 216 Forest Rd., Raleigh, N. C., Special Field Nurse, N. C. Maternal Health League, and State Board of Health

Otto J. Potthast, M.D., 314 Medical Arts Bldg., San Antonio, Tex., Member, City Board of Health

Public Health Nursing Section

Edna B. Ebright, Box 142, Niles, Calif., Public Health Nurse, Alameda County Health Dept.

Edna C. Harrington, Board of Health, Honolulu, T. H., Staff Nurse

Leah M. Keable, 115 Court House, Duluth, Minn., Supervisor of Nurses, Arrowhead Public Health Unit

Cynthia M. Mabbette, State Board of Health, Ocala, Fla., District Supervisor of Nurses

Virginia L. Stockard, R.N., 1303 W. High St., Jefferson City, Mo., Field Advisory Nurse

Epidemiology Section

Dr. Dario Curiel, State Health Dept., Louisville, Ky., At present—student, Johns Hopkins School of Hygiene and Public Health, Baltimore, Md.

Gordon R. Gray, M.D., C.P.H., 268 Guy Park Ave., Amsterdam, N. Y., Assistant Epidemiologist, State Dept. of Health

Dr. A. L. Briceno Rossi, Este 4 No. 145, Caracas, Venezuela, S. A., Head of Epidemiology Service, Dept. of Health

Unaffiliated

Leon Adler, Mooresville, Ind., Manager, National Motion Pictures Company

Edward A. Bogdan, M.D., 48 Church St., Amsterdam, N. Y., Consultant, Syphilis Clinic, Health Dept.

A. B. Fitzgerald, M.D., Box 22, North Creek, N. Y., Taking Health Officers course

John G. Grant, M.D., College Hospital, Ames, Ia., Professor and Head, Dept. of Hygiene and Student Health Service, Iowa State College

John F. Southwell, M.D., 287 State St., Albany, N. Y., Clinician, Social Hygiene Clinic, Memorial Hospital

SIXTY-SIXTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION

New York, N. Y.
October 5–8, 1937

NEW YORK HOTELS

THE three headquarters hotels are: The Pennsylvania, The New Yorker, and The McAlpin. The rates at these hotels are given below; rates of other New York hotels will be sent to you upon request to the Association.

It is urged that you make your reservation early, and use the Reservation Blank supplied herewith.

		Rate per Day				
	Room Capacity	*Single Room*	*Double Bedded Room*	*Twin Bedded Room*	*Suite for One*	*Suite for Two*
Pennsylvania	2,000	$3.50 up	$5.00 up	$6.00 up	$11.00 up	$13.00 up
New Yorker	2,500	3.50	5.00	6.00		
McAlpin	1,300	2.50 up	4.00 up	4.50 up	8.00 up	10.00 up

.....(Cut off on this line and mail to the hotel of your choice).....

HOTEL RESERVATION BLANK FOR NEW YORK MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
50 WEST 50TH STREET, NEW YORK, N. Y.
OCTOBER 5–8, 1937

To
(Name of Hotel)

Please reserve for me rooms for persons for the A.P.H.A. Meeting.

Single room Double room

Maximum rate per day for room $..... Minimum rate per day for room $.....

I expect to arrive If date of arrival is changed I will notify you at least 24 hours in advance.

Please acknowledge this reservation.

Name

Street address

City State

NEWS FROM THE FIELD

HEATING AND VENTILATING EXPOSITION

THE Fifth International Heating and Ventilating Exposition will be held at Grand Central Palace, in New York City, January 24–28, 1938. Since its inception in 1930, the Heating and Ventilating Exposition has been held every two years. The first showing was in Philadelphia, the second in Cleveland, the third in New York City, and the fourth, which took place in 1936, was held in Chicago. Each successive Exposition has met with an increasingly active response, both on the part of exhibitors and audience.

Perfect weather indoors the year round will be a theme of the Fifth Exposition.

SCHOOL EXHIBIT

THE Fifth Annual Summer School Exhibit, sponsored by the School of Education of New York University, will have projects and other materials from public and private schools on display from July 5th to 21st on the main floor of the Brown Building, Washington Place, New York.

FRANKLIN INSTITUTE

AFTER a century, The Franklin Institute is now occupying its new building. The address is: Parkway at 20th Street, Philadelphia, Pa.

MISSOURI PUBLIC HEALTH ASSOCIATION

THE Missouri Public Health Association, affiliated with the American Public Health Association since 1928, held an interesting and well attended Annual Meeting on April 29 and 30, in *Springfield, Mo.*

Edwin Henry Schorer, M.D.,† was inducted into office as President of the Association and Merl P. Moon, Ph.D.,* of the Medical Department of the University of Missouri, was named President-elect.

NEW HEALTH UNITS IN QUEBEC

Hon. Albini Paquette, Provincial Secretary and Minister of Health of Quebec, announced recently the creation of 3 new health units: in Three Rivers, Arthabaska, Brome-Missisquoi, which will be ready to operate in July.

PERSONALS

DR. REUBEN A. BROWN, of the Alabama State Department of Health, has been appointed Director of Tuberculosis Control of the Louisiana State Department of Health.

DR. LEONCIO LOPEZ-RIZAL, Chief of the Administrative Division of the Bureau of Health of the Philippines, retired February 10, after 25 years in the government service.

DR. ABRAHAM I. PERLEY, of Coleanor, Ala., has been appointed Health Officer of Chambers County, Ala., succeeding DR. CHESTER E. JOHNSON, JR., resigned.

DR. DAVID M. PARKER, formerly a physician in the CCC, has been appointed Health Officer of Virginia, to succeed DR. JOHN A. MALMSTROM, resigned.

DR. JOHN W. TAPPAN, of El Paso, Tex., has been appointed Health Officer of the El Paso City and County Health Unit, succeeding DR. THOMAS J. MCCAMANT.†

REUBEN T. CRAWFORD, D.D.S., of Montgomery, Ala., has been placed in charge of the reinstated Division of Oral Hygiene of the Bureau of Hygiene and Nursing of the Alabama State Department of Health.

* Fellow A.P.H.A.
† Member A.P.H.A.

DR. JAMES FENTON, the Medical Officer of Health for the Royal Borough of Kensington (London, England), has been elected President of the Society of Medical Officers of Health. Dr. Fenton is the Chairman of the Central Council for Health Education, a past Chairman of the Royal Sanitary Institute, and an Honorary Fellow of the American Public Health Association.

ALTON S. POPE, M.D.,* recently Director of the Division of Tuberculosis of the State of Massachusetts, has been appointed Deputy Commissioner of Public Health, succeeding GAYLORD W. ANDERSON, M.D.*

STEWART G. THOMPSON, D.P.H.,* recently State Registrar in Florida, has resigned to become Managing Director of the Florida Medical Association. Dr. Thompson is Secretary of the Florida Public Health Association.

A. J. DOUGLAS, M.D.,* Medical Health Officer of Winnipeg, Manitoba, was recently honored with the degree of LL.D. upon the 60th Anniversary of the founding of the University of Manitoba.

DR. EDWIN M. IRELAND, of Coats, Kans., has been appointed Health Officer of Pratt County, succeeding DR. CHARLES E. PHILLIPS.

ROY R. JONES, M.D.,† Passed Assistant Surgeon of the U. S. Public Health Service, assigned to the division of labor standards of the U. S. Department of Labor, and DR. LEGRANGE B. BYINGTON, Surgeon, U. S. Public Health Service, in charge of the Baltimore Quarantine Station at Curtis Bay, Md., have been appointed members of the advisory committee on sanitation of the Baltimore City Health Department.

DR. E. BRIGHT WILSON, JR.,† an assistant professor of chemistry at Harvard University, will receive the 1937 prize of $1,000 awarded by the American Chemical Society in recognition of his experimental work in chemistry. Formal presentation will be made at the Society's 94th meeting in Rochester, N. Y., September 6–10.

THORVALD MADSEN, M.D., Director of the State Serum Institute, Copenhagen, Denmark, has for the seventh time been elected President of the Health Committee of the League of Nations. He is an Honorary Fellow of the A.P.H.A.

SIR FREDERICK GOWLAND HOPKINS, Professor of Biochemistry at the University of Cambridge, has been awarded the Harben Gold Medal by the council of the British Royal Institute of Public Health.

ROY F. FEEMSTER, M.D., DR.P.H.,* formerly Assistant Director of the Antitoxin and Vaccine Laboratory, has been appointed Director of the Division of Communicable Diseases in the Massachusetts State Department of Public Health.

DR. HOLLAND THOMPSON, formerly of the Maybury Sanatorium, Northville, Mich. (Detroit Municipal Tuberculosis Hospital), has been appointed Tuberculosis Clinician of Alabama State Department of Health.

EDWIN B. GODFREY, M.D.,† Health Officer of San Bernardino, Calif., has been appointed State Health Officer of New Mexico, to succeed JOHN ROSSLYN EARP, DR.P.H.,* resigned.

CARL N. NEUPERT, M.D.,† of Janesville, Wis., has been appointed Assistant State Health Officer of Wisconsin, succeeding DR. ETHAN B. PFEFFERKORN, of Oshkosh, resigned.

DR. WILLIAM J. CRAIG, of Shreveport, La., has been named Health Officer of Lawrence County, Ala.

PROFESSOR J. K. GEE, Superintendent

* Fellow A.P.H.A.
† Member A.P.H.A.

of the Woodbine Public Schools, has been appointed in charge of health education work at the Iowa State Department of Health, Des Moines.

HOWARD G. STEVENS, M.D., has been appointed Health Officer of New Milford, Conn., to fill the vacancy caused by the resignation of F. E. KING, M.D., and also Health Officer of the town of Bridgewater, to fill the vacancy caused by the death of MARY G. HASKINS, M.D.

DR. ELSWORTH L. GARDNER, of Portland, Ore., has been appointed Health Officer of Lane County, succeeding ALSTRUP N. JOHNSON, M.D.,† resigned.

DR. STEWART G. PATTON, of North Jackson, Ohio, has been appointed Health Officer of Mahoning County, to succeed GEORGE Y. DAVIS, M.D.,† of Youngstown.

DR. JOSEPH C. TATUM, of Waverly, Tenn., has resigned as Health Officer of Humphreys County, to become Health Officer of Giles County, succeeding JOHN U. SPEAR, M.D.,† of Pulaski.

J. CARROLL MONTGOMERY, M.D.,† of Wichita, Kans., has been appointed Health Officer of Sedgwick County.

DR. ALFRED E. EYRES, recently on the staff of the Health Department of Seattle, Wash., has been appointed Health Officer of Walla Walla, and Walla Walla County.

DR. MARION H. SEAWELL, of Jackson, N. C., has resigned as Health Officer of Northampton County.

DR. WALTER RALEIGH PARKER, of Woodland, N. C., has been appointed Health Officer of Northampton County, to succeed DR. MARION H. SEAWELL, of Jackson, resigned.

DR. WAYLAND N. MCKENZIE, of Albemarle, N. C., has been chosen to head a new health department in Stanly County to be opened in July.

DR. HAROLD C. WHIMS, of Waxhaw, N. C., has succeeded ROBERT M. BARDIN, M.D.,† of Rutherfordton, N. C., as Health Officer of Rutherford County.

DR. EUGENE E. HAMILTON, of New Leipzig, N. D., has been appointed Health Officer of Grant County, to succeed DR. LEONARD B. MOYER.

DR. ALBERT L. DAVENPORT, of Holdenville, Okla., has been appointed Health Officer of Hughes County, to succeed DR. CHARLES S. WALLACE.

DR. WILLIAM C. TREDER, of Scotia, N. Y., has been appointed Health Officer of Schenectady County.

DR. MURRAY P. WHICHARD, of Edenton, N. C., has been appointed Health Officer of Chowan County.

DR. CHARLES H. PEETE, of Warrenton, N. C., has been appointed Health Officer of Warren County.

DR. JOHN S. ANDERSON, of New Bern, N. C., has been appointed Health Officer of Craven County.

DR. EARL L. WHITE, U. S. Public Health Service, has been appointed Health Officer of Crittenden County, with headquarters at Marion, Ky.

DR. HERBERT E. KOEPKE, of Cadiz, Ohio, has been appointed Health Commissioner of Harrison County.

DR. WILLIAM EDWARD BLAIR, of Lebanon, Ohio, has been appointed Health Commissioner of Warren County.

DR. WILLIAM K. FAST, of Atchison, Kans., has been appointed Health Officer of Atchison County.

DR. FRED L. HOLCOMB, of Coldwater, Kans., has been appointed Health Officer of Comanche County.

DR. WILLIAM S. GOOCH, of Fort Scott, Kans., has been appointed Health Officer of Bourbon County.

DR. LAWRENCE F. SCHUHMACHER, JR., of Meade, Kans., has been appointed Health Officer of Meade County.

* Fellow A.P.H.A.
† Member A.P.H.A.

DEATH

HARRY GARLAND TIMBRES, M.D., DR.P.H.,† died of typhus fever on May 12, in Marbumstroy, Russia, where he was engaged in malarial research for the Russian Government. Dr. Timbres, who was a graduate of Johns Hopkins Medical School and the School of Hygiene and Public Health, was formerly an assistant in biostatistics at Johns Hopkins and had previously served in India as a Health Officer.

CONFERENCES

American Association of School Physicians. Annual Meeting in conjunction with Annual Meeting of the American Public Health Association. Hotel Pennsylvania, New York, N. Y. October 5–8.

American College of Surgeons. Chicago, Ill. October 25–29.

American Dietetic Association—Twentieth Annual Meeting. John Marshall Hotel, Richmond, Va. October 18–21.

American Hospital Association. Atlantic City, N. J. September 13–17.

American Public Health Association —Sixty-sixth Annual Meeting. New York, N. Y. October 5–8.

Association of Dairy, Food and Drug Officials of the United States. Raleigh Hotel, Washington, D. C. October 26–29.

Fifth International Congress of Radiology. Chicago, Ill. Sept. 13–17.

International Association of Milk Dealers. Dallas, Tex. Oct. 21–23.

International Association of Milk Sanitarians. Brown Hotel, Louisville, Ky. October 11–13.

Michigan Public Health Association. Lansing, Mich. November 10–12.

New England Milk Producers Association. Boston, Mass. October 26–27.

New York State Association of Dairy and Milk Inspectors. Hotel Utica, Utica, N. Y. September 22–24.

New York State Conference on Social Work. New York, N. Y. October 19–22.

Ontario Hospital Association. Toronto, Ont. October 21–23.

Rocky Mountain Medical Conference. Denver, Colo. July 19–21.

Southern Medical Association. New Orleans, La. November 28.

FOREIGN

International Congress of Medicine Applied to Physical Education. Paris. July 11–17.

International Congress of Public Health Work. Paris. July 12–16.

Health Congress of The Royal Sanitary Institute. Birmingham, England. July 12–17.

Second International Congress of Sanatoria and Private Nursing Homes. Paris. July 12–17.

Fourth International Congress of Compared Psychotherapy and Psychology. Paris. July 16–18.

Second International Congress of Mental Hygiene. Paris. July 19–23.

British Medical Association. Belfast, Ireland. July 20–25.

Congress of Infant Psychiatry. Paris. July 25–28.

British Dental Association. Cambridge, England. July 30–August 3.

Seventh Biennial Conference, Health Section of the World Federation of Education Associations. Tokyo, Japan. August 2–7.

World Congress of Universal Documentation. Paris. August 16–21.

International Union Against Tuberculosis. Lisbon, Portugal. September 5–9.

Fourth International Pediatric Congress. Rome, Italy. Sept. 24–30.

Second International Congress for the Protection of Infancy. Rome, Italy. October 4–8.

Congress of Physiologists. Paris. October 11–13.

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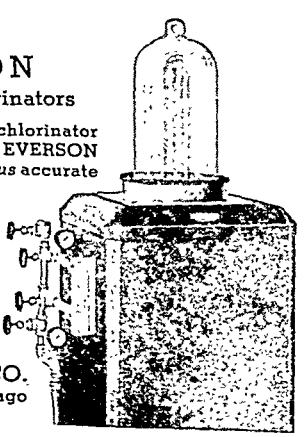
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Young man, S.B. in biology and public health; Massachusetts Institute of Technology, post-graduate course in health education, business administration and economics; desires executive position with official or non-official agency. Has been health officer of a city of 10,000 population for 9 years. A-296

Physician, M.D. Ohio State University, C.P.H. Harvard School of Public Health, seeks position as health officer or epidemiologist. A-297

Physician, M.D. Indiana University; C.P.H. Johns Hopkins University; special courses in epidemiology, biostatics and public health administration; several years' experience as physician to city health department; desires position as full time county health officer. A-269

M.D. desires position as health officer. Has been city and school physician for 4 years. A-280

Physician, M.D. Syracuse University, post-graduate studies in bacteriology and immunology, will consider position as health officer or epidemiologist. Has served as director of a county health unit, CCC camp and district surgeon, medical and sanitary advisor in public health and epidemiologic problems and venereal disease field survey officer. A-305

STATISTICIAN

Young man with 8 years' experience public health statistics in well known national organization and degree in Business Administration, now employed, will consider statistical position or combination with office administration. S-310

LABORATORY

Young man, A.B. in Chemistry, Phillips University; M.S. in Public Health Laboratory Work, University of Michigan, June 1937; desires position in state or city health department laboratory. L-304

Man with M.S. Major in Bacteriology and Biochemistry, desires position with university health department or hospital as bacteriologist. Five years' experience as research assistant and instructor in bacteriology and serology in a Class A medical school. L-306

Bacteriologist, Sc.D. Johns Hopkins University, experienced public health and research bacteriologist. Will consider position in public health or university teaching. L-312

CHILD HYGIENE

Pediatrician, graduate Columbia College of Physicians and Surgeons 1912, with excellent background of practical and administrative experience in large city health department, will consider position of teaching or administration in child hygiene. A-288

Young woman, M.D. Yale 1930, Dr.P.H. Yale, excellent background teaching and child hygiene administration, state and local, will consider an exceptional opportunity, preferably in the East. C-289

Physician, M.D. University of Iowa, with experience as state director of child hygiene and with a background of health education, has been full-time city health officer and teacher in Class A medical school, is available for position paying $5,000 per annum. A-290

Woman physician, M.D. Creighton Medical School, with extensive experience in maternal, infant and child hygiene and special interest in crippled children's service, desires position in field work. C-301

MISCELLANEOUS

Physician, M.D. Western Reserve University; M.P.H. Harvard; extensive experience in pediatrics and school medical service; also background of county health administration and teaching in Class A medical school; now employed; will consider expanded opportunity in teaching or research. M-302

Young woman, M.S.P.H. University of Michigan, experienced in laboratory research and health education, is available for research or investigative work. M-303

Experienced research microbiologist, Ph.D. Western Reserve University, will consider position in public health laboratory service or university teaching. M-291

Physician, M.D. Northwestern University; Ph.D. Johns Hopkins University; Dr.P.H. Yale University; is eager to secure general public health work, health center administration, infant welfare or epidemiology position. A-300

Young physician, M.D. University of Michigan, wishes position as epidemiologist, preferably in field and clinical work in syphilis control. M-307

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Physician with post-graduate studies in public health at University of Michigan, seeks employment in public health field. Has served as Acting Assistant Surgeon, U.S.P.H.S., part-time county health officer and assistant director of a state health department division of maternal and child health. M-309

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American Journal of

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And *The Nation's Health*

Volume 27 — August, 1937 — Number 8

How Much Control of Tuberculosis?

FROST

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TOBEY

Air Conditioning

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Sixty-Sixth Annual Meeting, New York, N. Y., October 5 - 8, 1937
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First 21 weeks of year	Number of cases reported	% increase over previous year
1935	3,981	
1936	4,692	17.9
1937	6,508	38.7

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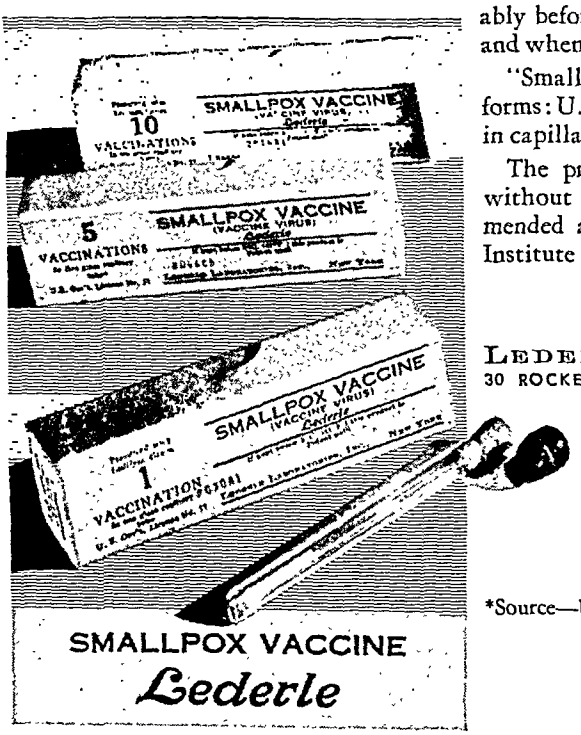
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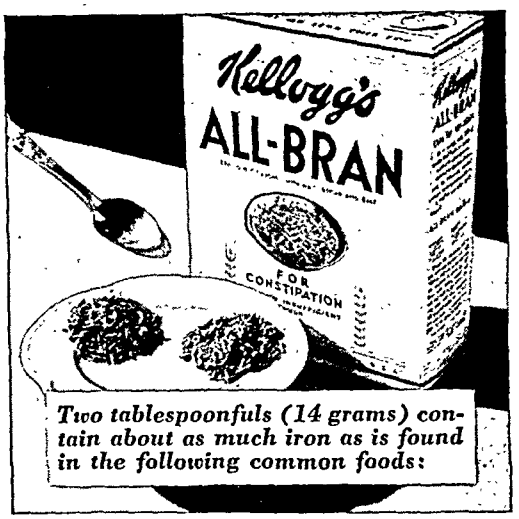
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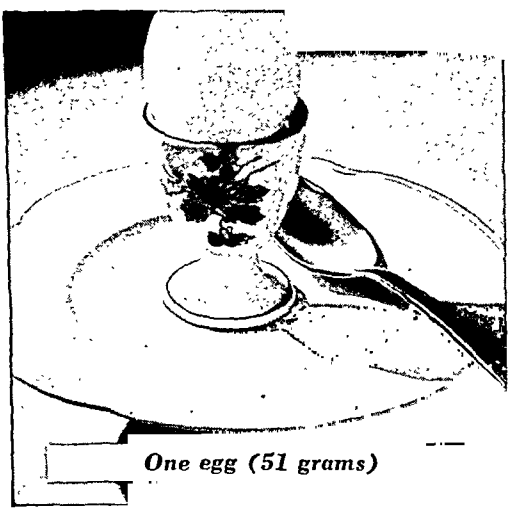
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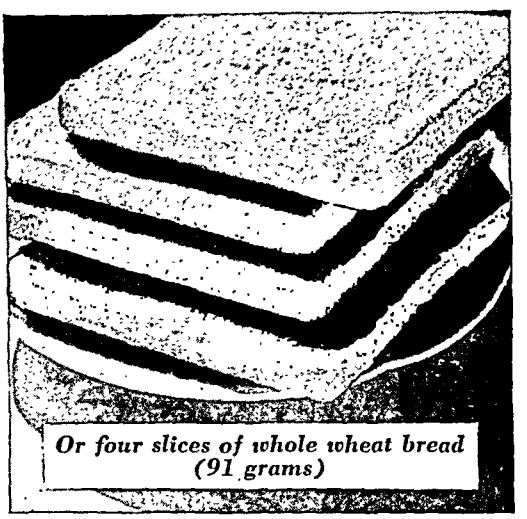
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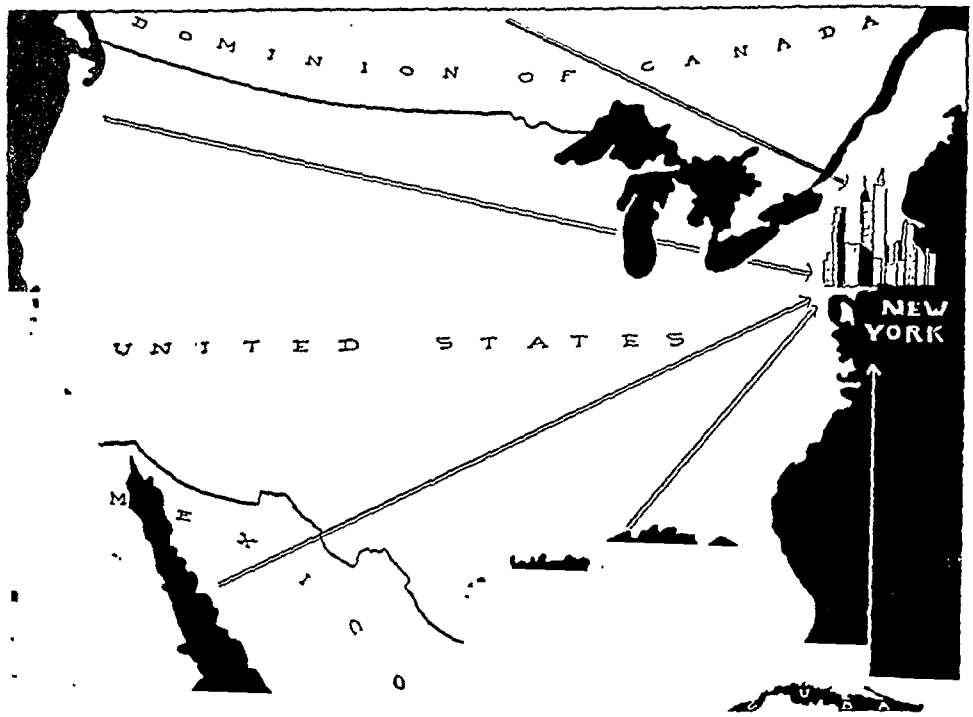
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How Much Control of Tuberculosis?*

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THE impetus for the modern campaign against tuberculosis came from Koch's discovery of the tubercle bacillus and his demonstration of its necessary rôle in the causation of the disease. From his evidence the inference was plain that the disease could be prevented if infection with the tubercle bacillus could be avoided. There was then, and there has been since, no reason to doubt the soundness of the thesis that complete protection against exposure to the tubercle bacillus would completely prevent tuberculosis; but there has been and is still grave doubt as to whether it is practicable to set up and maintain protective measures which will be sufficient to give this result.

The years that have elapsed since the campaign began have extended our knowledge of tuberculosis in every direction. They have brought improvements of great importance in methods of diagnosis and treatment, and have seen the building up of a tremendous machinery for the care of the tuberculous. But they have not brought forth any really new principle of prevention; they have produced no well proved and dependable method for lasting and effective specific immunization by artificial means and no simple specific cure for the disease. Thus, while organization and weapons have been improved, the essential strategy of the attack against tuberculosis remains the same as it was 50 years ago. The main objective is still avoidance of exposure, and the strategy is still that of a frontal assault on discoverable sources of infection. From the standpoint of prevention, curative treatment and measures designed to increase resistance to infection may be regarded as supplementary.

If we could measure the success of this strategy by the decline in mortality from tuberculosis, the results must be considered gratifying beyond expectation, for in this country, and quite generally in others where the progress of civilization has been comparable, mortality has steadily declined. For instance, in that part of the United States for which we have

* Delivered at the Annual Conference of State and Local Committees on Tuberculosis and Public Health of the State Charities Aid Association, Hotel Roosevelt, New York, N. Y., May 12, 1937.

continuous mortality statistics since 1900—an area made up largely of the northeastern states—the crude mortality rate from tuberculosis in 1933 was less than one-third of the rate in 1900. And, what is still more gratifying, the rate of decline has been more rapid in the latter than in the early years of this period.

There are, however, many and sound reasons for doubting that the general and rapid decline of tuberculosis during the last 50 years has been due *principally* to the measures which have been taken for the specific purpose of preventing infection. To mention only a few of these reasons; it is readily apparent that even in areas best provided with sanatorium facilities the isolation of open cases of tuberculosis is far from complete. Also, as has often been pointed out, the decline in mortality is not limited to those areas in which vigorous control measures have been carried out and when studied broadly shows no clear correlation with the extent of these measures. There is also conclusive evidence that although tuberculosis as a manifest disease has declined greatly, tuberculous infection remains high. It has not been uncommon in recent years to find, in cities, that more than one-half of the children attending public schools show evidence of infection (that is, a positive tuberculin reaction) before they have passed the age of 15, and that of adults past 30 few indeed remain uninfected.[1]

Moreover, the general doctrine that communicable disease may be prevented satisfactorily by avoidance of infection has fallen somewhat into disrepute as applied to those diseases which, like tuberculosis, are transmitted directly from person to person by way of the respiratory tract. The physical difficulties in the way of preventing this kind of person-to-person transmission are obvious enough; and, as bacteriological and immunological observations on the diseases of this class have been extended, it has been more and more convincingly demonstrated that even when the diseases themselves are of limited occurrence, as is true for instance of diphtheria, scarlet fever, and cerebrospinal meningitis, infection with the specific microörganisms which cause them is almost universal. It may, in fact, be accepted as a general principle that it is impracticable, in populous communities, so to isolate an individual from his neighbors as to insulate him continuously against exposure to infections transmitted directly in this way from other people. Such relative isolation as the most favored classes of society enjoy may serve to postpone the average age at which first infections occur; it does not nearly suffice to afford complete and continuous protection over such a period as 20, 30, or 40 years.

Therefore, for protection against diseases of this class, we have ceased to rely greatly upon simple avoidance of exposure and have turned to other measures, such as specific immunization and treatment and, in certain diseases such as measles and whooping cough, the device of postponing exposure from infancy until later childhood, when infection is less dangerous.

It has, moreover, become recognized that protection against exposure to highly prevalent, endemic infections, unless it can be kept up through life, may in the end prove more harmful than beneficial. For the same con-

1. It is generally conceded that the control of human infection from bovine sources has already been highly effective in this country and that further control is practicable. All that follows refers to infection from *human* sources.

2. This and preceding paragraphs should not be interpreted as implying that the isolation of known cases of the diseases of this group is useless. There is reason to believe that infections contracted from carriers at large in the general population may be less dangerous than those contracted in the immediate environment of clinical cases.

cealed infections which spread disease producing bacteria and viruses so widely through the population serve at the same time to build up a protective immunity. And since a good many infectious diseases are apt to be more severe in adults than in children between 5 and 15 years of age, the postponement of first infections from childhood to adult age may be actually disadvantageous.[2]

Finally, it is highly probable that the cyclic changes in prevalence which are observed in some diseases are brought about chiefly by evolutionary changes in the characteristics of the specific microörganisms, the causes of which are to be found in uncontrolled natural forces. Thus, within the last 100 years we have seen both diphtheria and scarlet fever, which previously were of widespread occurrence but relatively low prevalence, rather suddenly take on a much more malignant character and attain a much higher prevalence more or less throughout the world. Then, after some decades of high prevalence and malignancy, they have in the last 40 years gradually declined both in prevalence and severity. With respect to these and a number of other epidemic diseases, such as influenza, cerebrospinal meningitis and poliomyelitis, the explanation of such cyclic changes in severity and prevalence remains obscure, but we are obliged to recognize at least the possibility that they may be due to the operation of natural forces beyond human control.

When these epidemiological conceptions, which are firmly enough established with respect to various of the acute epidemic diseases, are applied in interpreting the epidemiology of tuberculosis, they tend obviously to cast doubt upon the efficacy of the measures which have been taken to control tuberculosis by limiting exposure to the tubercle bacillus and upon the possibility of establishing permanent and complete control on this principle. However, the extremely pessimistic view of tuberculosis control which has been taken by many eminent students of the subject overlooks some important considerations which bear upon the question.

One of these considerations is the probability that infection established by a small number of microörganisms may be less severe in its course than infection resulting from a larger or frequently repeated dosage.[3] As regards human infection with the tubercle bacillus, the epidemiological evidence to this effect is fairly impressive and is supported by a good deal of evidence from experiments on lower animals. It may well be, therefore, that the measures which have been taken to limit the spread of the tubercle bacillus in our environment, even though they are insufficient to prevent eventual infection of nearly everybody, may still be of great effect in mitigating the *severity* of resulting infections, because of reduced frequency and dosage of infection. If this is so, it is a consideration of real importance.

It is also to be remembered that the frequency of exposure to the tubercle bacillus may have been reduced much more than would appear to be indicated by the results of tuberculin tests. For instance, if we find that at 15 years of age 60 per cent of the population show a positive tuberculin reaction, which we may take as evidence of prior infection with the tubercle bacillus, it is obvious that, under the worst conditions which can have existed in the past, the proportion infected before reaching this age could not have been greater than 100 per cent. It may therefore appear that there can have been no more than a

3. See reference 2.

40 per cent reduction in the prevalence of infection, whereas we know that there has been a much greater reduction in mortality. However, assuming a random distribution of exposure, the rate which would result in infecting approximately 99 per cent within 15 years is some 4 times the rate which would infect only 60 per cent within that period.[4] Therefore, the simple fact that under present conditions nearly everybody who reaches middle age shows evidence of having been infected with the tubercle bacillus does not at all imply that there has been no great reduction in the rate of exposure to infection.

A still more important consideration which has been too frequently overlooked when tuberculosis is compared with other communicable diseases transmitted directly from person to person by way of the respiratory tract, is that the tubercle bacillus is differentiated from other disease producing organisms of this group by the conditions governing its growth within the body and its escape from the infected host. When the tubercle bacillus invades the body it does not multiply upon the surface or in the superficial layers of the mucous membrane. It penetrates to the deeper tissues and, as it multiplies, is surrounded by a protective cell-wall which the body throws around it. In order to escape into the outside world and infect others it must break through this defensive wall. In pulmonary tuberculosis—the type of most consequence in the spread of infection—this result is relatively infrequent. In the great majority of infections the bacillus is walled off within the body, and the lesion eventually heals without breaking through to the external air passages. Thus, the conditions which limit the propagation of the tubercle bacillus are: (1) that in order to escape from its host it must cause a lesion which breaks through to the surface—in general an extensive lesion which severely damages the host—and (2) that it succeeds in producing such lesions in only a limited proportion of infected persons.

Various other pathogens of man are subject to one or the other of these conditions, but not to both. For instance, the virus of measles appears to be spread only from persons actually suffering from or in process of developing the eruptive disease; but the virus is so highly infective and pathogenic that it succeeds in producing this effect in nearly all persons who survive to adult age. On the other hand, the diphtheria bacillus, the pneumococcus, the virus of poliomyelitis, and various other pathogens transmitted by way of the respiratory tract, cause clinical disease in only a small proportion of those who are infected; but actual disease is not essential to propagation of these microörganisms, since sub-clinical or "carrier" infections, being equally "open," suffice to spread them from host to host, and to perpetuate the species.

The combination of these *two* limiting conditions is the peculiarity of the tubercle bacillus which makes it more amenable to control by case-isolation than are diseases such as diphtheria, scarlet fever, and measles. For notwithstanding that the tubercle bacillus infects nearly everybody sooner or later, most of the infections are "sterile," in the sense that although the bacilli multiply within the body they do not escape to reach other hosts. Only the relatively small proportion of infections which progress to the stage of open lesion are successful

4. The conditions assumed in making these calculations are of course entirely hypothetical, and much simpler than obtain in nature. The figures given are to be interpreted only as illustrating the principle that exposure rates may differ much more widely than would be indicated by casual comparison of the results of tuberculin tests.

in spreading the infection to others,[5] and it is only these sputum-positive cases that need to be isolated in order to prevent the spread of infection.

If the effective control of tuberculosis required *complete* isolation of *all* open cases, throughout the whole of their open stage, the present status could not be considered encouraging, for a large proportion of such cases are discovered only after they have reached a fairly advanced stage; and the isolation even of cases known to the health authorities is probably less than 50 per cent complete.

However, for the eventual eradication of tuberculosis it is not necessary that transmission be *immediately* and *completely* prevented. It is necessary only that the rate of transmission be held permanently below the level at which a given number of infection spreading (*i.e.*, open) cases succeed in establishing an equivalent number to carry on the succession. If, in successive periods of time, the number of infectious hosts is continuously reduced, the end-result of this diminishing ratio, if continued long enough, must be extermination of the tubercle bacillus.

Bearing in mind this principle, it is a fair inference that in this country as a whole we have already reached the stage at which the biological balance is against the survival of the tubercle bacillus, for year by year the mortality from tuberculosis is decreasing. It is true that we do not have equally direct statistical evidence of a proportionate decrease in the prevalence of infective cases, taking into account not only the number of cases but duration of the open stage; but there appears to be no good reason to doubt that the prevalence of open cases is diminishing at something like the same rate as mortality from phthisis. This means that under present conditions of human resistance and environment the tubercle bacillus is losing ground, and that the eventual eradication of tuberculosis requires only that the present balance against it be maintained.

As to maintenance of this balance—favorable to us, unfavorable to the tubercle bacillus—there are, of course, elements of uncertainty, among them uncertainty as to the stability of our civilization. But if it be assumed that environmental control affecting the spread of tubercle bacilli from existing foci can be maintained at its present level (and we may justly expect to improve it), we know of only two forces which, singly or together, would check or reverse the downward trend of tuberculosis. These are: (1) a decrease in human resistance to the disease, or (2) some fundamental change in the adaptation of the tubercle bacillus to its host, tending to favor survival of the parasite.

With respect to the latter possibility, we can do no better than base future expectations on past experience. Upon this basis, if we were discussing diphtheria, scarlet fever, or influenza, their past history would lead us to expect future changes, more or less sudden, in the disease-producing properties of their causative organisms. But present knowledge of tuberculosis is consistent with the view that the specific properties of the tubercle bacillus have not changed appreciably in modern times; and in the absence of compelling evidence for such variation in the past, we are under no necessity of anticipating it in the future. Therefore, while we have no means of excluding this possibility, I do not know of any reason why we should expect it.

A question of more immediate concern is whether, with progressively diminished exposure to tuberculous in-

5. It is quite possible that tubercle bacilli may escape from apparently "closed" lesions more frequently than is implied here; but epidemiological evidence indicates that demonstrably open pulmonary lesions are of predominant importance in the spread of infection.

fection, we must expect such decrease in human resistance to this infection as would check or reverse the present downward trend.

It is probable that one of the most important factors in the decline of tuberculosis has been progressively increasing human resistance, due to the influence of selective mortality and to environmental improvements such as better nutrition and relief from physical stress, tending to raise what may be called nonspecific resistance. It is, however, a reasonable expectation that the increase in average resistance due to these causes will be maintained, for, while complete elimination of the mortality from tuberculosis would check this process of raising genetic resistance, there is no apparent reason why it should result in reversion to a state of higher average susceptibility than exists today. Also, any gains due to better nutrition and to other elements of personal hygiene should be permanent if civilization continues at its present level or a higher one.

The kind of resistance which is of a less permanent order and which seems more likely to be lost, is individual specific immunization by so-called latent infection. At present a majority of the population in many areas acquire their first infection with the tubercle bacillus between late infancy and adolescence, precisely at the age when the immediate reaction to infection is most favorable. However, further reduction in the prevalence of tubercle bacilli in the environment must necessarily postpone first infections to a later average age; and, as it is believed by some authorities that primary infection is more dangerous in adults than in children, it is feared that such postponement of infection will in the end prove disadvantageous.

The question which is thus raised cannot at present be answered with assurance. We do not yet know enough about the nature and durability of any immunity which may be conferred by infection acquired in childhood. It is, however, significant that in those areas where childhood infection is most common, we find the highest mortality in adult life; and that in areas such as Cattaraugus County, N. Y., where a majority of adolescents are demonstrably tuberculin negative, the mortality in adult life is low. Also, occupational statistics show that in adult life the mortality from tuberculosis is lowest in the professional group who, as a class, have been least exposed to infection in childhood. Therefore, while this whole question obviously needs much more study, there is at present no compelling evidence that the downward course of tuberculosis must be checked by eventual loss of mass immunity.

We need not assume, then, that tuberculosis is permanently and ineradicably engrafted upon our civilization. On the contrary, the evidence indicates that in this country the balance is already against the survival of the tubercle bacillus; and we may reasonably expect that the disease will eventually be eradicated. There can be no certainty of this result, but it is an expectation sufficiently well grounded to justify shaping our tuberculosis control program toward this definite end.

As regards means to this end, an effective program of tuberculosis control must first of all be definite and specific, aiming at the prevention of tuberculosis by the most direct methods possible. At the same time it cannot be too greatly narrowed; it must not only provide for the discovery and medical care of tuberculosis and isolation of open cases, but must equally include a generous plan of social assistance. It is impossible, within a brief space, to discuss the details of such a program, extending as it must in many directions. The most that can be done is to summarize the principal

kinds of activity and to set them in an order of relative importance. This I think should be about as follows:

1. The isolation in sanatoria of *all known* open cases of pulmonary tuberculosis, continuing isolation so long as the cases remain open.
2. Adequate medical care, preferably in institutions, for the *known* cases of tuberculosis which are active but not in an open stage, since these cases constitute the group most likely in the immediate future to become infectious.
3. More vigorous effort to find cases of tuberculosis earlier and to bring them more promptly under medical care and under isolation if they are discharging bacilli
4. Special protection, including medical observation and advice, and financial aid as needed, for those groups who, though not at the time suffering from tuberculosis, are most imminently endangered.

The isolation of *known open* cases is placed first because it is the most direct method that we have for reducing the prevalence of tubercle bacilli in our environment; the measure which, applied to the smallest number of people, gives the maximum of protection to the community. It is also one of the measures at present often neglected or compromised by makeshift attempts at home isolation. But the broader reason for giving first place to the isolation of open cases is that if this is carried out thoroughly it leads up to all the other measures indicated. For it is in the household associates of the open case that the search for additional cases should begin, with the certainty of finding some that are in need of medical care; and, if prevention of tuberculosis is the aim, nowhere is generous financial aid more urgently needed or better justified than in the families of the tuberculous poor who bear the double risk of intimate exposure to the tubercle bacillus and poverty.

Thus the known open case is the logical center from which to develop protective measures of all kinds. And merely to carry out *thoroughly* this one item in the program, the institutional isolation of all known open cases, is no simple matter. It involves much more than diagnosing the cases and providing beds for them at public cost. It equally involves inducing the patients not only to enter the institutions, but to remain there as long as may be necessary, and making it possible for them to do so. The medical and social organization which best meets all these needs in all discovered cases of open tuberculosis will, I think, be the organization best prepared to spread its activities more widely from this center.

How far the tuberculosis control program should extend in the direction of general social betterment is a question which, perhaps, need not be answered. Probably nothing has been more influential in bringing about the decline of tuberculosis than progressive improvement in the social order as a whole; and nothing, perhaps, is more essential to the further effective control of the disease than to hold up, and so far as possible to improve, the standards of living of the lower economic strata. Obviously, the tuberculosis control program cannot expand to include the whole scheme of social betterment; but it can, and I think it should be concerned with raising the standards of living of those groups who are in most imminent danger of tuberculosis, beginning with the families of the tuberculous, and extending thence as far as practicable.

As regards the families of persons suffering with open tuberculosis, I think a clear distinction should be made between the kind of public aid given them and that which is given generally to the poor who are disabled. For if we are to require the isolation of open tuberculosis as a matter of public protection, it becomes a public responsibility to bear not only the cost of medical care, but the whole cost to the

patient's family, or as large a share as may be required. Moreover, it should be recognized that what is needed is not bare maintenance on a minimum or average "relief" standard, that it is not sufficient merely to prevent their dropping lower in the economic scale; it may often be necessary to raise them to a higher level. The two conditions which most favor tuberculosis are intimate exposure and poverty. Where these two meet is where double protection is needed, and it implies more than free medical care and hospital beds.

As the prevalence of tuberculosis is progressively diminished, the control program must necessarily be readjusted, at least in a quantitative way, and I think it should also be changed somewhat in direction. The soundest principle to follow seems to me to be that as the cases become fewer and fewer, preventive measures should be centered more and more upon the open cases; that the protection thrown around these infective cases and their immediate contacts be not relaxed, but steadily and progressively increased. This is a sound principle of epidemiology, for it is to be expected that as the prevalence of the tubercle bacillus in the general environment is diminished, infection and disease will become more distinctly focalized. In fact, there is already evidence of increasingly wide differentiation between the most sheltered and the most exposed groups of our population; and even now we should take more cognizance of this in directing our efforts.

The principle of centering effort increasingly upon the open cases themselves is also sound psychology. As the menace of tuberculosis becomes less imminent, the public will naturally take less interest in general and diffuse measures of protection. But in proportion as the disease becomes rarer, less a matter of everyday experience, we may be assured that public opinion will not only support but will even demand more rigid isolation.

Living Conditions

IT is often overlooked, parenthetically, that in writing of disease physicians did not limit themselves to its clinical aspects. They were necessarily concerned with ultimate as well as immediate causes, with the predisposing social environment as well as with the actual infections. There is much valuable information on general living conditions among the poorer classes in this country, whether they were Negro slaves or Irish laborers, in the papers and reports of socially-minded medical men. The same is true for other nations. If your library happens to contain the English poor law board report of 1842, for instance, it possesses one of the most systematic accounts in existence of the living conditions in British cities in early Victorian days. This was essentially a medical survey.

In like manner the whole early literature on hygiene, both personal and public, possesses social meaning. Much of it found its way in the old days into the general libraries. When Sir John Sinclair prepared his bibliography of this subject about 1800, he was able to list nearly 1,900 items in European languages, which suggests that it was even then no small literature.—Richard H. Shryock. *Library Collections in Social Medicine,* Am. Library Assoc., 1936.

Recent Advances in Our Knowledge of the Problems of Air Conditioning*

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FROM the ameba to man, from the bacterium to the oak tree, the vital processes of all living things depend upon 5 essential factors: food (including regulative mineral salts and vitamins), oxygen, water, temperature and light.[1] Animals do not derive their food directly from the atmosphere but they do depend indirectly upon atmospheric nitrogen and upon the energy of the light rays which pass through the atmosphere as transformed into potential energy by the green plants. The other 4 factors as they influence the life of man are immediately related to the atmospheric ocean in which we live.

In addition to these positive essentials for existence, life depends on freedom from certain harmful conditions—mechanical injury, the presence of toxic chemical substances, and the attacks of inimical living things, predatory or parasitic. In all these 3 respects the atmosphere about us may play a part as the carrier of injurious dust particles, noxious gases and, under certain conditions, of the microbe of disease.

The relations of the atmosphere to human health and comfort are, therefore, manifold and important; and it may not be out of place to review briefly the progress which has been made during the past few years in our knowledge of this field of physiological science.

We may conveniently begin with the harmful foreign substances which may be carried by the atmosphere and, first of all, with injurious dust particles. This factor is of primary importance in various industrial processes. Every year brings new evidence of the gravity of the problem of silicosis. I am personally inclined to believe that the total influence of this disease and of the tuberculosis associated with it upon the mortality of the working population of the United States may be more serious than that of industrial accidents. It is certainly of vastly greater significance than the industrial poisonings. The control of this hazard, by the use of non-siliceous materials, by the introduction of wet processes or enclosed processes, by local exhaust ventilation and by the employment of adequate masks and respirators is one of the basic problems of air hygiene. In other industries, the presence of non-siliceous but irritating dusts is associated with high prevalence of pneumonia and bronchitis and other acute respiratory disorders. The dust problem has been solved in the Rand mines of South Africa (where no miner en-

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tering the industry since 1923 has contracted silicosis) and elsewhere, so that it is general administrative application rather than the availablity of effective preventive methods which is at fault.

Outside of industry, we have little exact information as to the effects of atmospheric dusts upon health. In cities where there is much dust and soot, there may be hygienic advantages and there are certainly esthetic advantages in the removal of the suspended solids carried in the street air before its admission to occupied spaces. This may be accomplished by the use of air washers, by impingement on viscous coated surfaces or by filtration through dry screens and the amount of dirt collected by such devices is at least visually impressive. One special application of such devices for the removal of pollen is of considerable importance for sufferers from hay fever,[2] and good devices are available for a single room as well as for central ventilating plants.

The next type of foreign impurity which must be considered in connection with the atmosphere is that which involves the presence of living microörganisms, particularly those of pathogenic nature. When Chapin, a quarter of a century ago, demonstrated the superior importance of disease transmission by food, fomites, and contact, as contrasted with air and dust this problem was relegated to a position of insignificance. The recent work of W. F. Wells at Harvard has, however, reopened the whole question. Wells first of all devised a new instrument for the enumeration of bacteria in air which appears to be distinctly superior to any earlier device used for this purpose.[3] Second, he demonstrated the important fact that while droplets of a certain size (over 0.1–0.2 mm. in diameter) settle rapidly to the floor, those below this critical value lose their water by evaporation before they fall for any considerable distance,[4] and showed that bacteria suspended in fine droplets would actually persist in considerable numbers in the atmosphere for many hours.[5] These results certainly indicate the possibility of air-borne infection, and Wells has recently been working on the sterilization of the air of hospitals or sick rooms by ultraviolet radiation.[6]

This work of Wells deserves very serious consideration. There is always, however, a gap between the possibility of a given mode of infection and its practical importance. To the writer, the results of actual experience with the treatment of various communicable diseases in open wards weighs heavily against the idea that aerial transmission has great quantitative importance, so far as bacterial infections are concerned. Such experience shows that diphtheria and scarlet fever can be nursed in an open ward without cross-infections, while with chicken pox and measles in their early stages cross-infections occur in spite of all precautions.[7] The recent extension of Wells's work to the virus infections[8] should be of substantial practical importance in connection with the operation of isolation hospitals for the virus diseases, but there seems to the writer, in the light of clinical and epidemiological experience, to be no basis whatever for a general program of atmospheric disinfection in living and work places.

From this consideration of the non-living and living suspended particles present in the atmosphere, we may turn next to the problem of its chemical composition. In the 18th century, the bad effects of vitiated air were attributed to lack of oxygen, but Lavoisier in 1777 showed that the changes in oxygen content in the worst ventilated rooms are below the threshold of physiological significance. The toxic influence of carbon dioxide was then assumed to play a major rôle, but this

view too was exploded by Pettenkofer in 1862. For practical purposes variations in oxygen and carbon dioxide content of the atmosphere seem relatively unimportant at ordinary atmospheric pressures on the earth's surface. In deep parts of mines or at high altitudes oxygen deficiency is, of course, of major significance.

In various industrial establishments and wherever automobile engines, gas heaters, or other heat sources operate under conditions of imperfect combustion, carbon monoxide is a serious menace; and in industry benzol and many other toxic fumes and gases may present grave problems.

So far as the air of an ordinary occupied space is concerned there remains one other factor to be considered —that of the unidentified substances associated with the odors produced by human bodies and by various organic substances. Pettenkofer attributed the major influence of a vitiated atmosphere to hypothetical "morbific matter" given off in the breath; but all recent work has negatived the existence of definitely toxic materials of this kind. There is, however, reasonably clear evidence of an influence of such odors upon appetite which is of real hygienic significance. This was demonstrated by the New York State Commission on Ventilation with respect to body odors; while Greenburg and the writer reported that the growth rate of guinea pigs was retarded by fecal odors. Recently, Herrington and the writer have shown in a more carefully controlled study that relatively slight odors of heated house dust (even when not consciously perceived by the subjects) had a very definite effect in reducing the appetite for food,[9] an influence of distinct hygienic significance.

The old standard calling for an air change of 30 cu. ft. per minute per occupant (which still persists in many of our state laws and regulations governing school ventilation) was based on the Pettenkofer concept of "morbific matter" given off in the breath and bearing a direct relation to the elimination of carbon dioxide. The recognition that no such specifically toxic substances exist and that such odors as are present vary widely with many factors makes such a rigid universal requirement clearly unjustifiable; and the Committee on Ventilation Standards of the American Society of Heating and Ventilating Engineers 4 years ago wisely adopted the following more reasonable formula[10]:

> The quantity of air used to ventilate the given space during occupancy shall always be sufficient to maintain the standards of air temperature, air quality, air motion, and air distribution as herein required. Not less than 10 cu. ft. per minute of the total air circulated to meet these requirements shall be taken from an outdoor source.

It is, however, important that air change should be sufficient to avoid the presence of body or other odors such as have been shown to influence appetite. C. P. Yaglou at Harvard has made valuable contributions in regard to this problem and has shown that body odor, as might be expected, may vary widely with the cleanliness of the occupants, that it bears no close relation to carbon dioxide elimination and that it is impossible to fix any single standard of necessary air change applicable under all conditions. The volume of fresh air necessary to avoid odors may vary from 7 cu. ft. per minute (with adults in a room having 500 cu. ft. of air space per person) to 38 cu. ft. with grade school children of uncleanly habits in a room having 200 cu. ft. of air space per child.[11]

Natural ventilation, without fans, has therefore a wide field of usefulness but according to the *A.S.H.V.E. Guide* should be utilized as a rule where there is provided 50 sq. ft. of floor area and 500 cu. ft. of air space per occupant

and where effective openings in windows and skylights equal 5 per cent of the floor area.[12]

We may pass next from the problems which arise from the presence of specific impurities (dust, bacteria, and objectionable chemical substances) in the air to the general physical characteristics of the atmosphere itself and their physiological effects upon the human body. These effects are, of course, chiefly related to the elimination of the heat liberated in the vital process; but before proceeding to a consideration of this major problem we must allude briefly to alleged electrical and electromagnetic effects which have been considered as important by certain European investigators.

The claims of F. Dessauer at Frankfort that positively charged ions in the atmosphere tend to increase respiratory rate, basal metabolism, and blood pressure, and to produce headache and malaise, while negative ions decrease the physiological activities mentioned, cause a sense of exhilaration, and cure various pathological conditions associated with hypertension [13] have aroused wide interest. In Russia an Institute of Ionification directed by Tjichevsky has made even more extravagant claims along similar lines. Yaglou, however, has obtained essentially negative results with regard to the influence of small ions of varying charge.[14] The John B. Pierce Laboratory of Hygiene has conducted extensive researches on large ions (produced by the Dessauer apparatus) and has obtained negative results in experiments with human subjects, while experiments on animals with small ions were also without significant results.[15] Since these studies involved the use of millions of ions per c.c., all of one sign, while the atmosphere contains only some thousands of ions with positive and negative ions nearly equal in number, it seems certain that the influence of ionic charge as a practical problem of ventilation can be dismissed from further consideration.

The interesting fact brought out by Herrington and the writer [16] that a sense of subjective unpleasantness is associated with a high ion content in the outdoor atmosphere has no bearing on this question, since the relationship is manifest with both negative and positive ions irrespective of sign. The authors explain the phenomenon as probably due to the effect not of ionic charge as such but of the gaseous products of combustion which make up a large proportion of the ions in city air. If this view is correct, we have here new evidence of the subtle effects of minor atmospheric impurities upon psychological reactions.

In our introductory analysis of the environmental essentials for the life process, sunlight was listed as one of the 5 fundamental factors; and it was pointed out that the condition of the atmosphere is directly related to this factor in so far as atmospheric impurities limit the transmission of light rays. Sunlight is important from the standpoint of adequate illumination, as an aid to cleanliness, as a psychological stimulant, and, above all, from the effect of ultra-violet rays on the synthesis in the body of the anti-rachitic vitamin. We have here, then, a sound hygienic basis for the campaign against the smoke nuisance.

The possible physiological effects of electro-magnetic vibrations of specific wave lengths is a fascinating subject for speculation, and Leonard Hill has recently made surprising claims in regard to the influence of certain wave lengths upon the nasal mucous membranes. He claims that the rays from a dull red or dark source of heat excite a congestion of the nasal mucous membranes which markedly narrows the airways of the nose in sensitive subjects. (nose-closing effect). On the other

hand the effect of such long infra-red rays is supposed to be specifically neutralized by red or short infra-red rays lying between 25,000 and 30,000 Angström units (nose-opening effect). The work of Dufton and Bedford in England [17] and of Greenburg, Herrington, and Winslow in this country [18] has entirely failed to confirm the existence of "nose-opening" rays and has led to the conclusion that the "nose-closing" effect (which is a real one) is not related to electro-magnetic wave lengths but merely to heat, and can be reproduced quite as well by immersing the arm in hot water.

Aside, then, from the presence of harmful industrial dusts and of toxic fumes produced by industrial processes, or incomplete combustion, from the possible danger of aerial transmission of air-borne infections of the virus type, and from the psychological effects of body and other odors, the major effects of the atmosphere upon human health and comfort are related to its influence upon the loss of heat from the body. Except in the factory and perhaps in the hospital ward, this is the major outstanding problem of air hygiene.

The problem is by no means, however, a simple one. Heat losses from the human body are governed by at least 4 different environmental factors: air temperature, air movement, relative humidity, and the sum of the radiation effects of surrounding surfaces. Houghten, Yaglou, and their associates in the A.S.H.V.E. Research Laboratory at Pittsburgh began in 1923 a most important series of studies on the relative effect of the first 3 of these factors which have led to the highly significant concept of "effective temperature," an arbitrary index of the subjective reaction of the human body to a given combination of air temperature, air movement, and humidity. The effective temperature for any given set of air conditions is the temperatures of saturated air having a velocity or turbulence of 15–25 ft. per minute which would produce a sensation of warmth or cold equivalent to the actual combination of air temperature, air movement, and humidity described. On the basis of this index, the Pittsburgh investigators have prepared charts indicating comfort zones for winter and summer which have proved of the greatest value in the promotion of sound progress in the field of air conditioning.[19]

The Pittsburgh studies, however, almost completely ignored one environmental factor governing heat loss from the body—the influence of the radiating surfaces which surround it. Pettenkofer, 60 years ago, realized the importance of this factor but it was later forgotten and practically ignored until 15 years ago. Recently the significance of radiation effects has been recognized once more and a whole series of new instruments have been devised for measuring the influence of radiant heat, among which are the Globe Thermometer of Vernon,[20] the Eupatheoscope of Dufton,[21] and the Thermo-Integrator of Winslow and Greenburg.[22]

It is obvious that a rational analysis of the thermal equilibrium of the human body requires due consideration of all the 4 environmental factors of air temperature, air movement, humidity, and radiation as they influence loss of heat by evaporation and loss or gain of heat by convection and radiation. If the body were a simple physical mechanism like a eupatheoscope or thermo-integrator with an evaporating jacket, a consideration of the net influence of the 4 environmental factors would give a complete answer to the problem. The body is, however, by no means such a simple physical instrument. By constriction or dilation of the cutaneous blood vessels, by the secretion of sweat, and by increase or

decrease of metabolism, it alters its own thermal properties in response to a changing environment. It is reasonably clear that the sensations which one feels on a mountain top or on a sea beach with cool moving air and high radiation are distinctly different from those experienced in a room where the air is warm and still and radiant surfaces relatively cool even if the net balance of heat interchange be the same.

It is this problem of the physiological reactions of the human body effected by different avenues of heat interchange which now requires intensive study. At the John B. Pierce Laboratory of Hygiene we are devoting ourselves primarily to this problem. We have devised a new method of partitional calorimetry [23] for this purpose which is already yielding significant results. Our experiments are conducted in a copper booth whose surfaces reflect radiant heat without becoming warmed themselves so that a wide variation between air and wall temperature can be maintained. The subject is seated on a delicate scale which records evaporative loss and, by formulae we have deduced, it is possible to measure with a high degree of accuracy the heat losses due to convection and radiation by differences between mean skin temperature and air temperature and equivalent radiation temperature, respectively. Records of metabolism make possible a complete partition of heat interchanges over short periods of time; and the results already attained are revealing important differences in physiological response to the 4 specific environmental factors governing heat loss. Basic studies of this sort are, as we believe, essential to a comprehension of the physiological reactions upon which intelligent air-conditioning must depend.

We may now pass to a brief consideration of certain important tendencies in the practical art of air conditioning.

The first of these trends which seem of special significance is an increased emphasis on the insulation of occupied spaces, with respect to heat interchange by both radiation and convection. During the heating season it is, of course, obvious that the amount of heat artificially introduced will be materially influenced by the extent to which building construction limits heat loss. Thus, while a 1 inch thickness of concrete may transmit 12 B.t.u. per hr. per sq. ft. per Fahrenheit degree difference in temperature, the corresponding value for felt or glass wool insulation may be about one-quarter of a B.t.u. or one-fiftieth as much.[24] The development of new synthetic building materials may be of material aid in the simplification of this problem.

The introduction of one or more layers of aluminum foil or some other material which reflects radiant heat is of great value in increasing insulation, particularly when applied to the ceiling; and recent studies in England (founded on the pioneer work of Leslie in 1804) have stressed this factor, both for keeping heat in during the heating season and for protection against the sun's rays in the tropics.[25]

Aside from heat transmission through walls and ceilings, there are important heat losses by transmission through window glass and by actual infiltration of air through cracks and building materials themselves. These two factors combined may often equal or exceed the total loss by transmission through building materials. Double windows and the employment of weather-stripping materially reduce such heat losses.

In the field of heating and ventilation itself, there have been many technical improvements, particularly in the development of new devices for unit ventilation in an individual room.

The most interesting trend here is, however, the introduction of practical systems of radiant heating in England under the leadership of A. H. Barker. An ordinary exposed "radiator" actually emits less than half its heat by radiation. In the English radiant heating, hot water pipes are embedded in walls or ceiling so as to produce a surface temperature of about 100° F. or special heating panels are affixed to the walls and heated to a somewhat higher temperature by superheated water or by steam or electricity.[26] The use of radiant heating has two obvious advantages. It avoids the unsightliness and the utilization of space for heating appliances within the room and, since the radiant heat emitted is very gradually transformed into convected heat by the warming of other surfaces, marked convection currents are avoided and a very even temperature produced throughout the room. Opinions differ as to the cost of the process even in England, and its applicability to cold climates is still questionable. In combination with good insulation of buildings it may, however, have a real field of usefulness in this country. From a physiological standpoint there are indications that a cooler atmosphere combined with warmer walls may have distinct advantages.

The heating and ventilating engineer has a wide choice of procedures for air conditioning, ranging from heating by a stove and ventilating by a window at one extreme, to control of air quantity and air movement, temperature, humidity, and dust content by a central plenum system on the other. It is important to recognize that heating and ventilation are in essence two distinct processes and two processes which are often antagonistic, since the air supply necessary for ventilation in winter requires additional heat to balance its cooling effect.

The first factor to be considered is that of ventilation—or dilution of impurities—since it is clear that a certain minimum air change is essential to avoid the psychological effect of odors even where toxic substances produced by imperfect combustion or industrial processes are not present. Where ample cubic space per person is available, as in the ordinary living room or office, infiltration and the use of windows will suffice to produce the necessary air change and no special provisions for ventilation are required. In the schoolroom and somewhat larger offices the use of window inlets and gravity exhaust ducts will often prove adequate. In larger offices and workrooms and in auditoria the supply of fresh air by mechanical means (by local or central plenum systems) will be found necessary.

If harmful dusts or fumes are present, special local exhausts must be provided to remove them; and if the outside air contains objectionable dusts (or pollen) removal of these foreign materials by air washers or filters may be desirable.

The factor of air movement is not an important variable in the heating season (except in workrooms where great heat is produced locally). If other requirements are met the air motion will be adequate. As to the control of relative humidity, there is some difference of opinion but on the whole it seems that this factor is not particularly important except where high temperatures occur. At normal temperatures relative humidity may vary over a wide range without important physiological effects and the A.S.H.V.E. Ventilation Standards permit a range between 30 and 60 per cent of saturation; and there is no convincing scientific evidence that a relative humidity below the minimum value stated is seriously objectionable.

With the problem of minimum air change and air purity settled, the next

problem is that of the supply of heat necessary to maintain a comfortable temperature. This requires a balance between the heat lost from an occupied space and the outside air and the heat produced by the occupants and by artificial heating and lighting sources. In rooms that are not crowded, heating is the predominant factor. In crowded rooms the heat eliminated from human bodies causes a rapid rise of temperature which must be balanced by a plenum supply of relatively cool air. Between lies a zone in which heating and ventilation operate in a delicate equilibrium.

If a plenum air supply (central or local) is necessary to meet the requirements for air change, the convected air is usually relied upon to control heating as well as ventilation, often, of course, combined with other heat sources within the room. Where plenum air supply is not required, we may heat from a central plant with local heat sources (convectors, radiators of the usual exposed type, or radiant panels); or by local heat sources such as stoves or radiant heaters.

In planning heating systems there are two important problems which require further study and whose solution may prove of far-reaching importance in future practice. These are concerned with the physiological and engineering values of the relative temperature of air, and walls, and of the relative temperature (convective or radiant) at different levels within the room. The latter point has been emphasized by Brabbée[27] and the latter has been raised by the English studies of radiant heating.

A wholly different set of problems is presented by the attempt to cool occupied spaces during the summer season. It is somewhat strange that this possibility should have been so long neglected. Man long ago realized that he could keep warm in winter; but accepted the summer heat as a dispensation of Divine Providence. Summer cooling has recently, however, attained recognition on a wide scale, particularly with regard to the cooling of theatres and more recently of railroad trains. The provision of cooled rooms for infants in hospitals is of particular importance on account of the sensitiveness of the vasomotor system in young children.

Like many new things this business of summer cooling has at first been overdone. I think there can be little doubt that many people have been injured by the sharp contrast between air-conditioned trains and the outside atmosphere. The *A.S.H.V.E. Guide* (1936, p. 73) suggests that with an outdoor temperature of 95° F. indoor temperature should not fall below 80°, while at 90° outdoors the differential should be 12° and at 80° outdoors only 5°. The A.S.H.V.E. has now a special Committee on Comfort Standards for Summer Cooling which is making valuable contributions to this subject.[28]

Cooling effects may be produced either by lowering the temperature of the air by the use of refrigerants or by evaporation of moisture, by lowering humidity without change of dry-bulb temperature or by increase of air movement. (See *A.S.H.V.E. Guide*, 1936, Chapter 10.) Another simple but quite effective device for the dwelling-house is the installation of an exhaust fan in the attic to draw in cool outdoor air during the night.[29]

From this analysis it is obvious that "air-conditioning" in the modern sense is something very much more complex than was connoted by the older term "ventilation." Ventilation has been defined as "the process of supplying or removing air by natural or mechanical means to or from any space"—a purely quantitative concep-

tion. The basic definition in the 1936 *A.S.H.V.E. Guide* is, however, stated as follows:

> Air conditioning has for its objective the supplying and maintaining, in a room or other enclosure, of an atmosphere having a composition, temperature, humidity, and motion which will produce desired effects upon the occupants of the room or upon materials stored or handled in it.

Of the vital importance of air-conditioning in this sense, we have the amplest evidence. The studies of Ellsworth Huntington [30] have demonstrated that outdoor climates which are too warm or too cold, too moist or too dry, have a very definite effect in increasing mortality rates, while C. A. Mills has recently shown that an overstimulating climate is related to an excess death rate from certain metabolic diseases.[31] Arnold and his associates [32] in experiments with animals have demonstrated the mechanism by which a warm atmosphere increases liability to intestinal diseases by diminishing the intestinal blood supply and lowering the acidity of the gastric juice. We do not yet know, on the other hand, how a cold atmosphere increases susceptibility to respiratory diseases but that it does so is clearly indicated by the excess rates for pneumonia among workers exposed to overheating and subsequent chill.[33]

The laboratory studies of the New York State Commission on Ventilation [34] and the extensive observations of Vernon in English factories [35] have shown how important the effect of overheating may be in diminishing productive efficiency.

In considering the problems of air-conditioning, as in other fields of public health, we should no longer, however, be satisfied with the avoidance of obviously harmful conditions. Health is a positive ideal—not merely the art of staying alive. Our aim should be efficiency and fulness and joy of living. We should not be content with air free from harmful dusts, fumes, and odors, and air which is warm enough to avoid chill and cool enough to avoid obvious discomfort and enervation. What we desire is atmospheric conditions which produce an active sense of physical well-being, a state of euphoria such as is experienced on the mountain top or the sea beach to which reference has been made above. We need much more fundamental studies of physiological reactions before this is possible; but I am convinced that we stand on the threshold of an era in air-conditioning in which the pleasure of positive physical satisfaction, and not merely the avoidance of dangers to health, will be our primary objective.

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Social Medicine

CONSIDERABLE material on social medicine has appeared, in recent years, in the better known journals of opinion; for example, in *Harper's Magazine*, *Scribner's*, and *The Survey*. These are of course readily available. The reports of special foundations are not always so accessible. The *Annual Report* for 1931 of the Twentieth Century Fund noted that there were then at least 22 American foundations directly interested in health problems. In addition to these large foundations, there are many private societies that carry on research or propaganda relative to health insurance (such as the American Association for Social Security) and many others dealing with such special matters as birth control, the control of special diseases, mental hygiene, health education, the care of the physically handicapped, infant and maternal welfare, and so on.—Richard H. Shryock. *Library Collections in Social Medicine*, Am. Library Assoc., 1936.

The Sylvatic Plague Committee*

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A. ADMINISTRATIVE ACTIVITIES

THE executive committee in consultation with Dr. Ira N. Gabrielson, Chief of the U. S. Biological Survey, Washington, C. Gill of the Federal Works Progress Administration, and Assistant Surgeon General C. E. Waller of the U. S. Public Health Service, has aided the members of the committee in the preparation of state projects for rodent control. The California project was submitted on March 1 by the Department of Agriculture (total estimated cost $84,490). The committee members have been informed relative to newer developments by 6 confidential circular letters and copies of the minutes covering the meetings of the executive committee. Antiplague serum in small amounts will be kept available at the George Williams Hooper Foundation, Medical Center, San Francisco, Calif.

B. SCIENTIFIC ACTIVITIES

The Sylvatic Plague Committee has continued to collect information concerning the extent of human and rodent plague on the American Continent. The observations on sylvatic plague in 1936 and the interpretations of the scientific facts may be summarized as follows:

A. HUMAN PLAGUE

Four non-fatal human cases of plague have been bacteriologically proven. There is strong indirect evidence that a 5th case was infected with the plague bacillus. Three, most likely 4, cases occurred in California and 1 in Utah. The histories of these cases are very interesting and deserve detailed comment.

California Case 1—Veterinarian, age 37, Santa Rosa, Sonoma County, noticed on April 3, 1936, malaise, fever 102° F. and pain in the left axilla. In the left axilla one firm node, 3 to 5 cm., was felt; the skin over the node was erythematous and of brawny induration; no lymphangitis. On April 9 the patient was hospitalized in San Francisco. He appeared extremely ill and prostrated. The node was punctured and a few drops of fluid were cultured. On April 12 the broth enrichment culture yielded typical *P. pestis* which were readily agglutinated by a specific antiplague serum. The blood culture taken on April 9 was positive for the same organism on the 4th day of incubation. On April 15 his temperature reached a normal level but a sharp rise due to an old arthritis occurred on April 19; within 5 days it subsided and the patient was discharged on the 27th day; recovery has been uneventful.

Since this case of *pestis minor* originated in a county in which neither murine nor sylvatic plague had been recognized, a searching investigation was instituted. It was learned that the veterinarian had on March 31, 2 days before the onset of his illness, treated an 8 months old cat with an

* Abbreviated from detailed Second Report presented before the Western Branch American Public Health Association at the Eighth Annual Meeting in Phoenix, Ariz., April 13, 1937.

abscessed jaw, brought to the hospital from a cabin in a forest region in which rodents are rarely observed. The cat died before a diagnosis could be made. Inquiries revealed that the cat had some contact with a skunk a few days before the swelling developed on the jaw about March 15. In the course of the survey, 476 rodents—rats, mice, and squirrels—*Citellus douglasii* (286 specimens) were examined but no gross plague infections were established. Suspicion was therefore centered on the cat and the knowledge concerning plague infection in this carnivore has been collected and is summarized.

The susceptibility of cats to plague was first established by the Austrian Plague Commission by feeding them with the bodies of animals dead with *P. pestis*. McCoy and Chapin, Toyama, and others have also reported the susceptibility of cats. Spontaneous infections (12 cases) have been observed and bacteriologically proven by Robertson at Cape Town (1901); the type was bubonic affecting the glands of the neck and submaxillary lymph-nodes. Similarly, Hunter in Hong-Kong saw cats, which were used in the hunting of infected rats, suffer from acute or chronic plague. However, important is the recent report by Pirie in South Africa (personal communication) who found among 11 cats 2 with plague bacilli in the spleen. Neither animal had obvious lesions of plague and it seems probable that cats may often die from a surfeit of plague-infected rodents (? from a toxemia) without becoming definitely infected. Other carnivores, such as the suricate and the yellow mongoose, are frequently found dead in the wake of a plague epizoötic but without actual infection.

Although the rôle of the cat as a possible link in the transmission chain of the *P. pestis* from rodents to man should always be kept in mind, it must be emphasized that the owner of the cat involved in the Sonoma case had very intimate contact with the pus removed from the abscess 2 days before he brought the animal to the veterinarian. He has remained well. The veterinarian remembers that he used his right hand in lancing and swabbing the abscess, while his bubo developed on the left side. The history of the only dog brought to the hospital and professional visits of the veterinarian were carefully investigated but the source of the plague infection in Sonoma County remains unexplained.

California Case 2—An 11 year old boy living in an isolated section of Monterey County, Calif., while cleaning a brush rabbit on June 13, cut his right thumb on a bone. No infection developed locally, but June 16 he complained of pain in the right axilla and was not feeling well. June 17 he had headache and considerable pain in the axilla and was taken to the hospital—temperature 104° F., pulse 96, respiration 22—prostrated and toxic, swelling in right axilla. On June 18 the temperature was 105.6°. Smear from bubo apparently showed bipolar organisms. Blood was inoculated into guinea pigs. June 19 the patient was much improved, temperature 103.8°. June 20 the maximum temperature was 103°; bubo was definitely palpable and tender. From this time on the patient showed gradual improvement, and June 23 the temperature was normal. June 25, guinea pig inoculated with blood taken June 18 died, and smears from organs showed many typical bipolar organisms.

Ground squirrels and brush rabbits are plentiful in the locality, but the patient denied shooting any ground squirrels recently, although his dog frequently brought them in. Ticks are plentiful, and he had been bitten by one 4 days before illness.

The examination of 1,378 rodents (*C. beecheyi* and rats) failed to reveal plague infected animals. In September *a pool of 259 fleas from 58 Citellus beecheyi* collected in an area north of the place in which the human infection occurred was *proved to be infected with P. pestis.*

California Case 3—A woman, age 50, living

in her summer cottage at Tahoe Vista, Lake Tahoe, Placer County, became ill July 23 with chills, high fever, nausea and vomiting, headache, and prostration. July 25 relapsing fever was suspected and 0.4 gm. neoarsphenamin administered. The blood smear proved negative and the patient was transferred to Reno July 27. A blood culture July 29 yielded a Gram-negative bacillus. August 1 small pustular lesions became evident on the outer surfaces of both lower extremities near the knee and hip joints. A few days later several large indurated areas were apparent on the left hip and the outer surface of the right leg just below the knee. On incision, several drams of thick purulent material was obtained. An organism indistinguishable from that isolated from the blood was cultivated. The patient was very ill and ran a fairly constant temperature around 103° F. for 1 week. With gradually subsiding temperature, normal was reached at the end of the second week and remained so until discharge on the 25th day after entrance. The 5 large abscesses drained for several weeks and healed uneventfully. The treatment was symptomatic; blood transfusions and intravenous sodium salicylate were given. The etiologic diagnosis was made by an identification of the two cultures —blood and abscess material—as *P. pestis* by the Hooper Foundation. Blood collected September 5, the 44th day of illness, agglutinated the plague bacillus in a dilution of 1:80.

As an isolated observation, this case offered diagnostic difficulties and without the cultures would doubtless have escaped etiologic identification. The absence of local or general lymphadenopathy failed to suggest bubonic plague. However, septicemic plague associated by petechiae and pustules with cellulo-cutaneous necroses in the gluteal region have been seen by many observers even in ancient times. This so-called carbuncular variety, as a rule, appears only at the middle and decline of an epidemic when the type of the disease is less fatal. It is generally believed that the mortality of this type is less than the bubonic form.

Inquiries disclosed the important fact that the woman buried a dead chipmunk about a week before the onset of her illness. She did not notice any type of insect bites and did not see any ticks. Although 999 rodents (*C. beecheyi, Sciurus, Callospermophilus, Eutamias, Glaucomys,* etc.) were examined, no plague infections were demonstrated. *Three batches of fleas collected from these rodents and tested on guinea pigs proved to contain P. pestis.* In October, Dr. C. R. Eskey proved the plague in a Tahoe chipmunk (*Eutamias quadrivittatus Frate*) trapped about 30 miles from the region in which the human case had occurred.

California Case 4—A 10 year old boy with a history of a squirrel bite without penetration became suddenly ill at a camp in the San Bernardino Mountains June 26, 1933; vomiting and high fever were recorded until he was hospitalized July 1. Chief symptoms—highest temperature 104.4°, remittent type, enlarged tender inguinal, axillary and cervical lymph-nodes; a punched out ulcer ½ cm. in diameter on the back in the region of the twelfth dorsal vertebra; pin-point papule on the abdomen left upper quadrant; July 22 normal temperature; uneventful recovery. Laboratory examination of cultures from the ulcer revealed Gram-negative bipolar bacilli; since the cultures were lost, no definite identifications have been made. The blood serum repeatedly tested by several laboratories failed to agglutinate *Bact. tularense,* but on the 39th day after the onset specifically clumped *P. pestis* in a dilution of 1:80 (4+) and 1:160 (3+).

In retrospect, the illness of this boy is correctly diagnosed as *Pestis minor* with a cellulo-cutaneous necrosis. Survey activities and post-mortems conducted in the Big Bear region during September and October on 1,302 rodents (406 Fisheri squirrels, 128 Golden-mantled chipmunks) failed to reveal one single plague infection. However, *2 pools of fleas, 1 of 104 insects collected in August from 38 Citellus beecheyi fisheri and another of 31 fleas from 24 squirrels shot in October in the Holcomb Valley infected guinea pigs with P. pestis.* The demonstration of infected fleas in the San Bernardino area not only supports

the anamnestic diagnosis made on the above case but also establishes the source of infection of a fatal case of human plague seen in a 67 year old male in 1933. Epidemiologically the evidence favored exposure to plague in the Big Bear region where the man owned a cabin; but since no infected squirrels had been found during the extensive surveys made from 1933 to 1936, the correctness of the epidemiologic reasoning was questioned. The examination of fleas solved one of those irksome riddles continuously encountered in the elucidation of sylvatic plague.

Utah—Early in July Dr. M. J. Macfarlane from Cedar City, Utah, submitted to the Hooper Foundation a specimen of pus removed from the axillary bubo of a 7 year old boy. The examination yielded an abundance of plague bacilli. From the history the following data are of general interest. June 24, 1936, the boy had been bitten on the left thumb by a squirrel. He was hospitalized June 29 with a high temperature and a provisional diagnosis of tularemia. Symptoms of meningismus, meningitis, and diphtheria dominated the early clinical picture. Subsequently, extensive maculopapular eruptions over the trunk and limbs with necrosis and suppuration accompanied by 5 buboes—1 in the left axilla, 2 in the cervical and 2 in inguinal regions—made their appearance. A typical bronchopneumonia accompanied these septicemic manifestations. The boy eventually recovered and was discharged from the hospital after 54 days. A critical analysis of this case leaves no doubt that similar observations may be made any time and anywhere and that the nature of the successive clinical diagnoses of meningitis, diphtheria, streptococcic sepsis, and tularemia may be clarified only by proper laboratory examinations.

Through the subsequent survey activities of the U. S. Public Health Service, the existence of sylvatic plague among the squirrels (*Citellus grammurus*), marmots (*Marmota flaviventris englehardti*) and prairie dogs (*Cynomys parvidens*) was fully proved.

The observations on 5 human plague cases in 1936 may be summarized as follows:

1. Despite the serious septicemic nature of the infections, the patients made uneventful recoveries. The plague strains involved possess the same infectiousness for guinea pigs as established for other cultures isolated from man and rodents during 1933 to 1935.

2. In 4 of the 5 cases direct contact with squirrels and other rodents was established. It is significant and noteworthy that the histories fail to report flea bites.

3. The importance of early laboratory examinations of the blood, aspirated lymph-node juice and pus, by experienced bacteriologists and serologists is again emphasized. The value of the diagnostic serologic examination of the blood serum of patients suspected of plague deserves recognition.

4. From a preventive point of view, it is imperative that the public, particularly youths, be warned not to handle sick or dead rodents in the regions in which sylvatic plague has been recognized. The character of these warnings should be judiciously worded in order to prevent harm to the summer resorts and to avoid criticism by the uninformed.

B. RODENT PLAGUE

1. *California*—Accidentally a squirrel (*C. beecheyi*) with sub-acute plague was found by the Agricultural Commissioner in an area adjacent to an old sylvatic plague focus in Ventura County. The examination of 104 squirrels and 2 rats (*R. alexandrinus*) were negative for plague but *a pool*

of 317 fleas collected from 25 rodents was proved to carry P. pestis by animal inoculations.

The plague area discovered in 1934 in Northern and Eastern Modoc County is slowly extending south, and on the west it reached into the vicinity of a CCC camp. A total of 7,998 rodents (7,244 *C. oregonus,* 38 ground-hogs, etc.) have been examined and plague demonstrated in 40; 14 new ranches were recognized as sylvatic plague foci. In the territory covering these ranches 1,110 rodents were examined and *P. pestis* demonstrated in 40 or 3.5 per cent. Over 145 carcasses were picked up and although unfit for examination are gravely suspicious for plague; thus the percentage of diseased squirrels is close to 15 per cent. Only 5 of 67 pools of fleas yielded plague infections in guinea pigs on inoculation.

In the Big Valley District in Lassen County 3 new plague areas were discovered. Again the infection rate was low (0.9 per cent) in the 748 squirrels shot, but since 118 suspected carcasses had been found it is not unlikely that the incidence is closer to 14 than to 0.9 per cent.

Infected fleas have been collected from squirrels, chipmunks, chickarees, etc., in San Bernardino and Placer Counties, although gross anatomical lesions of plague have not been discovered in the 1,900 rodents autopsied in these counties.

Renewed sylvatic plague activity has been noted in Santa Cruz County. In an old focus which was found infected in 1927 and 4 new districts, the epizoötic was quite extensive. The disease incidence varied from 5 to 8 per cent (87 diseased squirrels were found among 1,577 *C. beecheyi* shot within and adjacent to the area). Seven of a total of 28 pools of fleas infected guinea pigs.

In this connection attention is drawn to the interesting fact that despite intensive surveys in the Kern and Tulare areas which were heavily infected in 1934, no diseased squirrels or *P. pestis* carrying fleas were discovered. The available data rather forcibly suggest that a new area may be active for sylvatic plague over a period of 1 to 2 years and then remain apparently silent for 5 to 8 years. Thus the C. Ranch in Santa Cruz County shows the following record:

August 29, 1927—2 infected squirrels
1930, 1931, 1932—Negative findings
1933, 1934, 1935—Negative findings
June 22, 1936—2 infected squirrels
June 26, 1936—8 infected squirrels
June 30, 1936—8 infected squirrels

Although the active suppressive measures may in part be responsible for this behavior, a number of other possibilities deserve further investigation.

2. *Idaho*—The field laboratories of the State Department of Public Welfare and U. S. Public Health Service started surveys on June 2, 1936, and covered 5 western and 5 eastern counties. In 2,119 rodents 27 revealed lesions suspicious of plague. Dr. C. R. Eskey demonstrated *P. pestis* in 108 fleas from 123 *Citellus armatus* shot on one ranch in Bonneville County, June 9–12. Mass inoculations of tissues from 2 *Citellus armatus* shot on June 23 on same ranch proved *P. pestis.* Mass inoculation of material 5 *Citellus armatus* (3 found dead and 193 fleas from 75 squirrels shot at the E. A. Ranch, Bonneville County, Ida., infected guinea pigs and *P. pestis* was isolated.

3. *Montana*—July, 1936, Dr. C. R. Eskey, U. S. Public Health Service, reported that fleas and lice taken from 7 groundhogs (*Marmota*) at the head of Small Horn Canyon, Beaverhead County, infected guinea pigs with typical plague (existence of plague in ground-hogs demonstrated for the first time).

4. *Nevada*—Sylvatic plague has been found in Elko County by inoculating fleas taken from 50 *Citellus oregonus* shot May 7, 1936, on a sheep ranch 8 miles northeast of Lamoille, Nevada. Dr. Eskey reports that the laboratory truck left Nevada shortly after the positive diagnosis of plague was made and did not return until the latter part of June. Therefore, not much work has been done to discover plague in ground squirrels of Elko County.

5. *Utah*—July and August the Public Health Service—Dr. C. R. Eskey—demonstrated plague infection in 1 *Citellus grammurus* found dead in Beaver Canyon, Beaver County, Utah, July 16, 1936; 1 *Citellus grammurus* found dead in Indian Creek Canyon, Beaver County, Utah, July 27, 1936; 315 fleas from 11 *Citellus grammurus* shot 11 miles northeast of Cove Fort, Sevier County, Utah, July 28, 1936; 1 *Marmota flaviventris englehardti* killed with a club in Indian Creek Canyon, 15 miles northeast of Beaver, Beaver County, Utah, July 31, 1936; 2 prairie dogs (*Cynomys parvidens*) shot August 6, 1936, 5 miles northeast of Panguitch, Garfield County, Utah; and 45 fleas from 23 prairie dogs (*Cynomys parvidens*) shot August 7, 1936, on Porter Ranch, 2 miles east of Hatch, Garfield County, Utah.

The survey studies made throughout the western states since 1908 and particularly since 1934 have conclusively proved that the rodents listed in Table I-A suffer from spontaneous plague. Those presumably suffering from spontaneous plague since infected fleas have been removed from their bodies are shown as Table I-B.

Experimentally, the susceptibility of the ground-hog (*Marmota flaviventer*), chipmunk (*Eutamias amoenus amoenus*), Sierra Nevada golden-mantled ground squirrel (*Callospermophilus chrysodeirus chrysodeirus* [Merriam]) and True white-footed mouse (*Peromyscus trucei trucei* [Shufeldt]) has been established.

The survival (in days after percutaneous (scarification) infections conducted in July and August were as follows:

Control guinea pigs: 4, 4, 5
Oregon squirrels: 4, 4, 5, 5, 3, 6, 6, 6, 5, 10, 1 survived
Chipmunks (*Eutamias*): 3, 3, 3
Sierra Nevada golden-mantled ground squirrels: 3, 3—cannibalism 3, 3
Ground-hogs (*Marmota*): 8, 10, 9, 2 survived
Peromyscus trucei: 3, 3

Of interest are the susceptibility tests on ground-hogs made before spontaneous plague had been demonstrated in these rodents. Irrespective of the

TABLE I-A

Rodents that suffer from spontaneous plague:

Sciuridae	Beecheyi ground squirrel	*Citellus beecheyi*
	Oregon squirrel	*Citellus oregonus*
	Utah spermophile	*Citellus armatus* (Nevada and Idaho)
	Rock squirrel	*Citellus grammurus* (Utah)
	Columbia squirrel	*Citellus columbianus* (Oregon)
	Richardson squirrel	*Citellus richardsonii* (Montana)
	Yellow-bellied marmot	*Marmota flaviventris englehardti* (Utah)
	Tahoe chipmunk	*Eutamias quadrivittatus frater* (Allen)
	Utah prairie dog	*Cynomys parvidens*
Muridae	Gilbert white-footed mouse	*Peromyscus trucei gilberti* (California)
	Western bushy-tailed wood rat	*Neotoma cinerea occidentalis*
	Intermediate wood rat	*Neotoma lepida intermedia*
	Dusky-footed wood rat	*Neotoma fuscipes*

TABLE I-B

Rodents presumably suffering from spontaneous plague since infected fleas have been removed from their bodies:

Fisher squirrels	*Citellus beecheyi fisheri*
Sierra Nevada chickaree	*Sciurus douglasii albolimatus*

site of infection—abdomen or lower hind legs—the days of survival varied between 8 and 10. The pulmonary involvements were quite extensive, in 1 instance accompanied by numerous intestinal ulcerations due to plague bacilli which doubtless had been swallowed in the tracheal mucous rich with *P. pestis*. Experiments on hibernating Oregon squirrels indicated slightly prolonged periods of survival. Following the usual scarifications, the animals succumbed to septicemic plague in 6 to 8 days. Susceptibility studies on rodents caught in old sylvatic plague foci are too limited to warrant conclusions.

C. VECTOR AND FLEA TRANSMISSION STUDIES

In accordance with the program suggested by Dr. C. R. Eskey, a number of studies have been undertaken. In California an attempt was made to collect large numbers of fleas and test the emulsions of the crushed insects by guinea pig inoculations. The fleas, which have been killed with chloroform, were combed from the cadavers of the wild rodents. They were transferred to physiological salt solution (in summer a 3 per cent salt solution is preferable in order to suppress bacterial growth) and shipped to the laboratory. As a rule, they were washed in sterile salt solution then ground in a mortar. The suspensions were injected subcutaneously into guinea pigs. For the sake of economy large pools of fleas collected from squirrels of a given area were so treated. A total of 338 pools covering 17,588 fleas collected from 6,839 squirrels, 719 rats, 38 groundhogs, 75 chipmunks, and 163 mice have been tested by this new procedure. The following important findings deserve recording:

Modoc County — Active plague area; 5 of 67 pools infected guinea pigs with plague.

115	fleas	from	12	Oregon	squirrels
33	"	"	104	"	"
45	"	"	178	"	"
144	"	"	137	"	"
37	"	"	139	"	"

Monterey County—Pool of 259 fleas from 58 *C. beecheyi* proved infectious.

Placer County—Seven of 73 pools collected from squirrels shot in infected areas contain fleas carrying *P. pestis*. Three pools prepared from 23 lots of fleas induced plague in guinea pigs as follows:

65 fleas from 9 *Eutamias*, 13 *Peromyscus*, 5 *Neotoma*, 1 *Sciurus* and 1 *Callospermophilus*

75 fleas from 8 *Sciurus*, 10 *Callospermophilus*, 5 *Eutamias*, 13 *Peromyscus* and 1 *Neotoma*

22 fleas from 1 chickaree (*Sciurus douglasii*)

San Benito County—On a ranch found infected in 1927 and annually examined for diseased rodents, a pool of 285 fleas selected from a larger collection removed from 122 squirrels proved infectious for guinea pigs.

San Bernardino County—Two of 42 pools carried fleas with plague bacilli. A pool of 104 fleas from 38 *Citellus beecheyi fisheri* infected guinea pigs and a pool of 31 fleas from 24 Fisher squirrels, both from localities in which continued post-mortem examination of rodents had failed to reveal plague, proved to be infected with *P. pestis*.

Santa Cruz County—Seven of a total

of 35 pools of fleas collected from diseased and apparently normal squirrels infected guinea pigs.

Ventura County—One pool of 317 fleas from 23 rodents carried *P. pestis*.

The significance of these results must be emphasized. Without the examination of fleas, the epidemiology of 2 human cases would have remained unsolved and the existence of sylvatic plague in 2 counties would doubtless be unknown. Furthermore, the demonstration of infected fleas on Fisher squirrels and 1 chickaree stigmatizes these 2 rodents as possible spontaneous hosts of plague. As a tool in the course of sylvatic plague surveys, the testing of fleas will prove of inestimable value. The few observations available also indicate that this method of examination will be useful in studying the persistence or disappearance of sylvatic plague from areas in which the disease has been active. It was always suspected that the search for diseased squirrels or other rodents is quite limited since many of the infected animals may rarely leave their subterranean burrows. By a judicious selection of the pools of fleas doubtless more information may be collected. The few promising results amply justify the increased cost and labor which the surveys of the future may entail.

Obviously, the flea surveys must be supplemented by identifications and numerical estimates of the species of fleas which are found on the rodents during the different seasons of the year. In California, a few preliminary attempts have been made with the assistance of Dr. M. A. Stewart, Assistant Professor of Entomology, College of Agriculture, Davis, Calif. Some identifications clearly indicate the complexities which will confront the biologist in determining the plague transmitting capacities of the different species of fleas which may be encountered.

In August, 1936, the Beecheyi squirrels in Monterey County were infested with *Hoplopsyllus anomalus Bak. and Diamanus montanus Bak.* in the proportion 57:68.

In July, 1936, the Oregon squirrels in Modoc National Park were infested as follows: *Oropsylla idahoensis* (Bak.) 71, *Thrassis acamantis* (Roths) 5, *Diamanus montanus* 3, and *Monopsyllus wagneri wagneri* (Bak.) 1.

The classifications of fleas taken from rats caught in Salt Lake City and vicinity during the month of September by Dr. C. R. Eskey disclosed the important fact that *Xenopsylla cheopis* was present in considerable numbers among the insects removed from the rodents caught in the vicinity of the city. Should squirrel plague occur in the areas where these fleas were found, the danger of an epidemic of rat plague would unquestionably be great. Human cases would be much more likely to follow plague infection among the domesticated rats. These and similar observations merely sketch the many potential ramifications which require detailed investigations.

Concerning the ability of these different species of fleas caught on wild rodents to transmit plague to man nothing is known. Already in connection with the discussion of human plague histories collected in 1936, it has been emphasized that the flea appears to play a decidedly subordinate rôle. Again attention should be called to the fact that among the personnel of the survey crews who have for years been exposed to fleas which in the light of the recent observations were infected, no case of plague has been observed. These and similar considerations have prompted Dr. C. R. Eskey, U. S. Public Health Service, to conduct a series of fascinating and promising experiments. Although it is anticipated that he will personally report his far-reaching preliminary findings,

it may not be out of place to mention one fact he so kindly gave me. The squirrel flea—*Hoplopsylla*—will attack man in very rare instances; even bite-transmissions to guinea pigs appear to be very difficult. While "blocking" of the proventriculus of the rat flea—*Xenopsylla cheopis*—is a proven fact and regurgitation of plague bacilli into the bite is the actual mechanism of transmission, Dr. Eskey has shown that in Diamanus "blocking" is not commonly observed; but the fecal droppings are infectious. In all probability the excreta of the insects are principally concerned in the transfer of *P. pestis* from the vector to the rodents and perhaps to man. These newer concepts greatly clarify the epidemiology of sylvatic plague and in part at least explain the very low incidence of human plague, despite the extensive reservoirs which have existed in many regions throughout California and the West. A study of the bionomics of the wild rodent fleas and systematic identifications of the insects found on squirrels in the vicinity of human habitations may furnish data concerning the possible exchange of vectors. That rat fleas may infect themselves on diseased squirrels and thus ultimately bring rural plague to man must be admitted and subjected to experimental inquiry. The problem of infected and infective fleas and the mechanism of transmission influenced by temperature and humidity is only a part of the sylvatic plague problem, but it is, in the judgment of everybody, the most important one, and the committee trusts that Dr. C. R. Eskey will pursue his auspicious researches with every possible assistance that can be given to him. Equally important is the solution of the problem relative to rôle of the vectors not merely as transmitters of infection but in carrying over the disease agent from one plague season to another.

D. BACTERIOLOGICAL STUDIES CONCERNING THE ORIGIN OF PLAGUE IN CALIFORNIA

It is quite generally believed that the West Coast of North America became infected in the course of the pandemic of 1894 which originated in Hong-Kong. Probably rats conveyed the seed to the shores of California and gradually spread it to squirrels, and from squirrel to squirrel the disease has assumed its easterly march as far as Montana. This interpretation of the available facts has received considerable support through comparative bacteriological tests which Dr. K. Kuraichi from the Manchurian Plague Laboratory conducted at the Hooper Foundation. He had previously established the important fact that the plague strains isolated in Manchuria, Mongolia, and Russia ferment glycerine, while those obtained from China, Japan, India, and Italy are unable to utilize this alcohol. While studying 23 recent and old cultures of *P. pestis* isolated in California, he found that they were glycerine negative (Beta type). In comparing the data available for 15 strains studied by Dr. W. M. Dickie and his associates 1924–1925 which were also glycerine non-fermenters, Dr. Kuraichi concluded that these cultures were descendants of the great pandemic strain which has spread to India, Argentine, South Africa, etc., by shipments and that the sylvatic plague of the North American Continent had no connection with similar endemic foci of Transbaikalia, Mongolia, or Southeastern Russia. This interpretation of these bacteriological findings deserves further attention although the impression conveyed by Russian and Japanese workers that glycerine positive strains are confined to Mongolia and East Russia is in part invalidated by the findings of Alpha type in South Africa by Pirie. Dr. Kuraichi's observations are suggestive but not conclusive.

Public Health Legislation*

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REGULATION of public health matters by legislative fiat has been the prerogative of governing bodies in this country for nearly 300 years. As early as 1647 a quarantine act was passed by the Governor and Company of Massachusetts Bay, in order to avert a threatened epidemic of yellow fever, which was then raging in the West Indies.

This act was the first sanitary legislation in North America of which we have a record. It was soon followed by numerous other laws adopted by the various colonies for the control of the ever-prevalent smallpox, for the suppression of nuisances, and for the prevention of yellow fever by means of maritime quarantine.[1]

After the adoption of the Constitution of the United States in 1789, by the terms of which the control of the public health was continued as a function of the individual states, the Massachusetts Legislature passed in 1797 the first comprehensive act for a system of local health administration. Under its provisions, a board of health was organized in Boston, with Paul Revere as president. Philadelphia had set up such a local board in 1793, when a great epidemic of yellow fever occurred, and New York had a similar organization in 1796, although of a somewhat temporary and desultory nature.

In 1855, during another of the terrible visitations of yellow fever, Louisiana created a temporary state board of health to act as a quarantining authority. The first real state board of health, however, was established in Massachusetts in 1869, nearly 20 years after such a procedure had been recommended in a notable document prepared by a statistician and educator, Lemuel Shattuck, who was chairman of the Massachusetts Sanitary Commission.

THE PURPOSE OF GOVERNMENT

In this report, which has been characterized as one of the greatest productions of sanitary statemanship, it is declared:

> The condition of perfect health requires such laws and regulations as will secure to man associated in society the same sanitary enjoyments that he would have as an isolated individual; and as will protect him from injury from any influences connected with his locality, his dwelling house, his occupation, or those of his associates or neighbors; or from any other social causes. It is under the control of public authority and public administration; and life and health may be saved and lost, and they are actually saved or lost as this authority is wisely or unwisely exercised.

This cogent statement, written in 1850, is an excellent text for any discourse on public health legislation.

* Read at the Eighth Annual Meeting of the Western Branch American Public Health Association in Phoenix, Ariz., April 15, 1937.

Government is, of course, organized for the purpose, among its other functions, of protecting and preserving the health and promoting the general welfare of its citizens. The sovereignty, as exemplified in this country by the state, cannot divest itself of this important duty, but it may delegate the execution of this power to its political sub-divisions, such as counties, municipal corporations, school districts, and local boards of health.[2]

Today every state has enacted public health legislation. Except in one or two particulars, such as vital statistics laws, this health legislation is as diverse as are the states themselves. There is no uniformity in the form and substance of these laws, and not much standardization in their mode of operation. Distinguished public health visitors from abroad are, in fact, bewildered and somewhat critical of the variety of health legislation and public health practices that may now be observed and encountered in our 48 sovereign states.

Although all progressive sanitarians will agree with the maxim attributed to one of the several Earls of Derby that, "Sanitary instruction is even more important than sanitary legislation," it is true, nevertheless, that effective laws are essential to sound public health administration. Despite some recent developments in the political science of this country, we are still living under a democratic form of government founded on the principle that it is one of laws and not of men.

Under the American plan of government, which is based on the wise theory of a separation of powers, laws are considered and then promulgated by the legislative branch of the government. These statutes are then turned over to the executive branch of the government for administration and enforcement, and the legislature has no further concern with them, except to amend or repeal the laws as public policies may dictate.

FUNCTION OF THE COURTS

All legislation and the manner of its enforcement are, however, subject to review by the third coördinate branch of the government, the judiciary. It is the duty of the courts to pass upon the constitutionality of laws, to interpret them in the interests of justice, and to rule upon their validity whenever actions are properly brought before them. By this means, and only by this means, may the constitutional rights of individuals be safeguarded. With the wisdom of legislation, the courts are in no way concerned, but with its propriety under the federal and state constitutions they are, and should be, very much concerned.

Since 1827, when an American tribunal first upheld a sanitary ordinance,[3] the courts in this country have been liberal in sustaining all reasonable public health legislation, and in upholding the proper actions of health officials under the laws. The courts have universally recognized the rights of the states under their reserved police power to regulate lives and property, to restrain personal liberty, and to take summary measures in the proper interests of the public health.

The courts have recognized these privileges and duties of the states even when they have come in conflict with provisions of the federal constitution, but only when there was a reasonable necessity for action in behalf of the public health. When health laws, regulations, or procedures have been unreasonable; have discriminated improperly between persons or classes; have denied due process of law, the equal protection of the laws, or freedom of contract; or have capriciously interfered with interstate commerce, they have been nullified by the courts.[4]

Public health law in this country is,

therefore, not merely a matter of legislative enactment and executive administration, but it is also court-made law. The judiciary examines legislation and evaluates administrative procedures in accordance with constitutional limitations and the precedents of the common law. Sanitarians must be broadly familiar with these legal principles, as well as with the contents and texts of the statutes that apply to their official duties.

In 1923, for example, the Supreme Court of Arizona had before it an ordinance of the town (now the city) of Yuma with reference to the production of pure milk, and the prevention of adulteration of this important and indispensable food. The appellant, who had been convicted in a police court of offering to sell milk containing boric acid, alleged that the town had no authority to pass the ordinance; but the court held that this power was conferred in the charter granted by the legislature and in the laws of the state, even though milk control was not specifically mentioned.[5] This court declared:

> It would be a vain thing to provide by law for a municipal board of health and not empower the corporation to take necessary steps to aid it to preserve and protect the public health. Taking sub-section 28, *supra,* and the law creating boards of health, and construing them together, we think impliedly, if not directly, the legislative body of the town of Yuma had power to license and regulate the sale of milk and its products within its limits, and to forbid its adulteration, and to punish those violating ordinances enacted for that purpose.

THE SCOPE OF HEALTH LEGISLATION

Legislation includes state laws, municipal ordinances, and the rules and regulations made by executive departments in conformity to law. Although the legislature is the only branch of government that actually can make a law, and it cannot delegate this power to make laws, the legislature can delegate the power to make rules and regulations to carry out the intent of the statutes. Such proper rules and regulations have all the force and effect of law, although they may be more rigidly construed by the courts than are the enactments of legislative bodies.

Today there is a profusion of public health legislation in this country. In each state the health laws, sanitary codes, and the rules and regulations of the state health department are printed in ponderous and uninspiring volumes requiring hundreds of pages. In addition, there are innumerable ordinances and local regulations on health, some of which are available in printed form. Supplementary to this unwieldy mass of written legislation are more than a thousand court decisions on public health, which form the so-called unwritten law on this subject.

Despite this prodigality of legislation on health matters, the public health laws in many states are inadequate and insufficient. Not only is there the great variation in the provisions of the laws in the different states, but in many instances legislation that is obsolete, obsolescent, or unenforceable remains on the statute books. It is a cardinal principle of efficient government that no law or regulation should be enacted unless it is enforceable and unless there is a sincere intention to enforce it vigorously and impartially.

In every state a survey of public health legislation and an appraisal of the status of public health administration throughout the state should be made at periodic intervals, certainly at least every 10 years. This has been the regular procedure in such progressive commonwealths as Massachusetts and New York, which have long been recognized leaders in the field of public health. A survey of this nature may logically be undertaken under the aus-

pices of a special state commission authorized by the legislature and appointed by the governor, or it may be conducted by public health experts employed under the supervision of an appropriate state committee. Arizona, which has had a state health organization only since 1903, is to be commended for its recent action in making a public health inventory of the current public health situation in this state.

REVISING HEALTH LEGISLATION

As a result of professional appraisals of this type, suitable health legislation can be prepared for the consideration of the state legislature. Proper bills embodying effective public health procedures and administrative organization should be drafted by a committee of experts, including authorities on the scientific aspects of public health, authorities on law, and authorities on rhetorical expression, since clarity, brevity, and simplicity are essential features of all good legislation.

Assistance in these endeavors may sometimes be obtained from state legislative drafting services, and opinions as to the legality of proposed measures may often be secured from the state attorney general. Unfortunately, there is at present no national source of adequate information on public health legislation. The U. S. Public Health Service has collected and published some valuable data on the subject, but it is not the function of this federal bureau to promote, prepare, or even to advise on state legislation, unless directly invited to do so by the state authorities.

In a paper presented before the American Public Health Association 14 years ago, the author made some practical suggestions for the much needed coördination of the public health laws of the United States, and proposed that there be organized under suitable auspices a national bureau or institute of public health law.[6] Since that time, reliable information on various legal aspects of public health has been made available from different sources, but not much has been accomplished in bringing order out of our present legislative chaos in the public health field.

CODIFICATION OF PUBLIC HEALTH LAW

A national institute of public health law should survey and appraise all existing legislation pertaining to health, and should examine critically the rulings of the courts on this subject. As a result of such a study, there should be prepared the outline of a model state health code, which could be adapted to various local conditions. Supplemental to this there should be a model health ordinance for municipalities, which contains the essential features of a desirable law, but is sufficiently elastic to be useful under different local conditions.

Another function of the proposed institute on public health law would be to standardize the manner of presentation of pamphlet compilations of the health laws in the states. Most states issue such documents, which are of some value in acquainting the public and local officials with the provisions of the laws, but most of these pamphlets are worthless to practising attorneys. They now often suffer from such defects as poor arrangement, complexity, lack of annotations to court decisions, indifferent indexes, bulk, typographical and other errors, and poor printing.

In addition to these duties, this proposed institute of public health law should be available for consultation and advice to harassed health officials who contemplate legislative activities or who are confronted with litigation in the courts. The institute should not, of course, attempt to act as a substitute for competent local attorneys, but should merely be expert counsel in a

specialty that requires unusual knowledge and special facilities.

Such an institute might be organized under the auspices of the American Public Health Association or the National Health Council, or it might be connected with one of the leading schools of public health, with university background. It should, of course, be adequately financed for a continuing period, and properly housed and staffed.

This plan offers a practical solution to the problem of improved public health legislation in this country. The problem is not a new one, for as early as 1875 the American Public Health Association appointed a committee under Dr. John Shaw Billings to develop a method for the appraisal of public health activities. Included in the report of this committee was a section on public health laws, regulations, and officials-municipal.

In England, where public health authority is centralized in the national government, in contrast to its almost complete decentralization in the United States, a codification of the public health laws is now in progress. Codification of the public health law in this country is equally desirable, and would represent a most valuable contribution to modern public health administration and practice.

About a decade ago, Dr. Charles V. Chapin wrote:

> Few health officers entering upon their work know much about law, or even about the structure of our government. The propagandists of great health movements are likely to know even less. They may fear that human nature may interfere somewhat with law enforcement, but they little realize the legal impediments in the way of securing the prompt adoption of their rules. It never occurs to them that the Federal Constitution may be in their way, or their state constitution, or some existing statute, or possibly a municipal ordinance. Still less do they realize the power of the courts. . . .[7]

The successful administration of public health activities is founded upon the existence of adequate, reasonable, and competent health legislation. Public health officials must, of course, be scientists as well as statesmen, but as statesmen they must realize that humane and workable laws are the real basis of a successful democratic government.

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Modified Methylene Blue Reduction Technic*

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ONE of the outstanding advantages of the methylene blue reduction test (A.P.H.A. 1934) [1] is that, while the interpretation of results should be made only with an adequate knowledge of the available information pertaining to the test, the technic of operation may demand a less exact training than either the agar plate or microscopic counts. For this reason the methylene blue reduction test has been useful in many situations where otherwise bacteriological control of the milk supply would be difficult or impossible. Therefore, any extensive complication of the technic of the test should be adopted as standard on this continent only on presentation of proof that the modification compensates with greater accuracy.

Skar (1913),[2] observed more uniform reduction when the tubes of milk were shaken during incubation. Thornton and Hastings (1927, 1930),[5, 6] Johns (1930),[3] Thornton (1933),[4] and Wilson (1935) [7] all used the shaking modification which, on Wilson's recommendation, has become the standard technic in Great Britain. Such shaking results in decreased reduction times in most better-class milks and lessened variability in replicate samples as well as uniform disappearance of the dye in the individual tubes. Each of the last 4 workers cited has expressed belief in the greater accuracy of the shaking technic although none has yet substantiated his opinion with acceptable proof or successfully measured the extent of greater accuracy.

The main criterion of accuracy which these workers appear to have accepted as adequate is the comparative degree of variability in replicate tubes subjected to the two tests. It should be pointed out that variability is only one component of accuracy and probably constitutes a very incomplete measure of the accuracy of either test. There can be no doubt that the absolute accuracy of either test, or their comparative accuracies, still awaits determination.

If it can be shown that there is a high correlation between the results of the two tests, there can be little difference in their average accuracies. A coefficient of correlation between the results of the standard and modified methylene blue reduction tests calculated for 332 market milks of many classes was found to be 0.94 ± 0.004. Consequently neither test greatly ex-

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cels the other in accuracy, despite the greater variability displayed in the standard test which may lead to inaccuracy in evaluating an individual milk.

It is probable that the proposed shaking modification would complicate the test to the extent that uniform technic would be improbable in the hands of some who are at present satisfactorily performing it. Since compensation by greater accuracy is not apparent, the writer can find no justification for adopting the modified test as standard on this continent.

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New Home of the Mellon Institute

THE new home of the Mellon Institute in Pittsburgh was dedicated on May 6. This Institute is "a guild of scientists provided with facilities for productive effort and for mutual aid, coöperation, and protection in investigating thoroughly problems of importance in pure and applied science." In a booklet called "Symbolism in the Mellon Institute" there is described a series of medallions representing the scope of scientific research. These medallions bear the emblems of American scientific and professional societies, representative of the principal fields of science and technology. "These medallions, which signify the general character and breadth of the Institute's recognition of, indebtedness to and collaboration with these organizations and their realms and also the scope of scientific research, both pure and industrial," are here described. Three medallions are centrally located on the floor of the vestibule and typify chemistry (American Chemical Society), chemical engineering (American Institute of Chemical Engineers), and physics (American Institute of Physics). The other ten medallions are placed in the aisle space separated from the main lobby by the columns, occupying center positions among these columns. Science in general is indicated by the seal of the American Association for the Advancement of Science. Sanitary science, public health, and industrial hygiene are represented by the seal of the American Public Health Association. Pharmacy, pharmaceutical chemistry, pharmacology, and drug technology are represented by the American Pharmaceutical Association seal; while medicine is represented by the emblem of the American Medical Association.

The following aspects of research in public health have been carried on by the Institute: municipal smoke and dust control, factory air hygiene, sleep and sleeping equipment, various nutritional problems, dental hygiene, and the hygienic aspects of cooking utensils, dishwashing, laundering, and dry-cleaning. Other investigations have pertained to disinfectants and insecticides.

Standardization of Tablets for Determining Methylene Blue Reduction in Milk*

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AS the first extensive use of methylene blue reduction as a test for the sanitary quality of milk was in Denmark, it is natural that the first effort to prepare standardized tablets for this test should be made in that country. Tablets for this purpose were on the Danish market before 1920, and samples of them were obtained for investigation in this country between 1920 and 1924. A sample furnished the Stain Commission in 1922 was analyzed and found to contain an average of 20.2 mg. actual dye per tablet, giving a dilution in milk when prepared according to instructions of 1:400,000. Two years later, Hastings (1924) published a report on the comparative strength of several different lots of tablets. He did not give any determinations of actual dye content but gave figures as to the relative strength of 2 lots of Danish tablets compared with 3 lots of American tablets prepared in 1923. As the actual dye content of these latter is known, it is possible to compute from Hastings's data with a fair degree of accuracy the amount of methylene blue contained in the 2 lots of Danish tablets. In this way, Hastings's sample No. 1 contained about 30 mg. per tablet, and his No. 2 about 22.5 mg. per tablet. These would give dilutions of 1:270,000 and 1:360,000, respectively, in milk. These tablets, the bulk of which consisted of sodium chloride, crumbled easily, which was undoubtedly responsible for some of the variation; it may well have accounted for such a difference as that between the 2 lots computed to contain 20.2 and 22.5 mg. per tablet. Such a difference, however, as that between Hastings's samples No. 1 and No. 2 seems too great to be accounted for in this way.

Apparently there was considerable variation in the strength of the Danish tablets on the market in the early 1920's. This variation is even more striking today as a new lot of Danish tablets was analyzed in 1935 and found to contain only 14.6 mg. per tablet, giving a dilution of 1:555,000 when employed as directed. This last sample is apparently only half the strength of Hastings's sample No. 1 obtained from Denmark in the early 1920's.

In the meantime, Danish tablets have been used very little in this country because an American concern has been putting similar tablets on the market

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which have been approved by the Committee on Standard Methods of Milk Analysis, and each lot tested by the Biological Stain Commission. The American tablets are made up with a vehicle having greater binding power than the sodium chloride used in the Danish product. This lessens the crumbling and makes the tablets more uniform in weight.

The first American tablets were prepared in 1923 and were intended to duplicate the Danish tablets. The manufacturers were very successful in doing so and furnished tablets averaging 21.5 mg. each, which compared very closely with the 20.2 mg. found in the Danish sample submitted to them for duplication. When these tablets were put into experimental use, however, attention was called to the fact that in America the prevailing custom was to make the test in 10 c.c. of milk instead of 40 c.c. as called for by the Danish method. In order to insure the same dilution in the milk it was decided that the tablets should contain only one-quarter as much dye as the Danish. Such instructions were given the manufacturers when they prepared the first lot designed for actual use that were subsequently certified under the number NA-1.

When first preparing the tablets on a commercial scale the manufacturers were less successful in obtaining the desired dye content. The batch of tablets NA-1 proved to contain only 3.3 mg. each instead of between 5 and 6 mg. as desired. They, however, gave satisfactory results and were accepted without this discrepancy in dye content being especially noticed. The next 2 batches prepared, NA-2 and NA-6, were intended to duplicate the batch NA-1 and did so very closely. Unfortunately, each batch was a little weaker than the preceding, with the result that NA-6 contained only 3.03 mg. per tablet. This lot, as a matter of fact, produced such a weak coloration of the milk that serious objections were heard; and the company was requested to see that the next batch contained slightly more methylene blue. Batch NA-8, manufactured in 1934, contained an average of 3.57 mg.

Table I, giving the data in regard

TABLE I

Dye Content of Methylene Blue Tablets

Batch	*Weight of Tablet*	*Dye Content*		*Dilution in Milk as Used**
		Per cent	*Weight*	
Danish	grams		mg.	
Reported by Hastings (1924) No. 1	?	?	ca. 30	1:280,000
No. 2	?	?	ca. 22.5	1:375,000
From Breed (1922)	0.5	4.04	20.2	1:420,000
New Lot (1935)	0.57	2.25	14.6	1:580,000
American				
Exper. Lot (1923)	0.5	4.3	21.5	1:390,000
Cert. NA-1 (1923)	0.3	1.1	3.3	1:685,000
" NA-2 (1928)	0.32	0.99	3.18	1:715,000
" NA-6 (1931)	0.313	0.97	3.03	1:750,000
" NA-8 (1934)	0.313	1.14	3.57	1:635,000
Proposed New Standard	0.3	2.5	7.5	1:300,000

* Computed as follows:

$$\text{Dilution} = \frac{200 \text{ (grams water)}}{\text{grain dye}} \times \text{c.c. milk} \times 1.03 \text{ (sp. gr. milk)}$$

Final figures rounded for convenience

to these tablets, shows that the American tablets have been standardized to a very much greater extent than the Danish, and that the 2 most recent batches from each source tested have very nearly the desired ratio to each other of 1:4; thus the last American tablets give a dilution in milk of 1:625,000, and the last Danish tablets 1:555,000. The difference between these 2 lots when actually employed with milk is just barely detectable in the shade produced.

Recently Thornton, as referee for the Committee on Standard Methods of Milk Analysis, has pointed out that there are serious objections to methylene blue in the form of the chloride which has always been employed, largely because of the difficulty in standardizing the dye itself and in preventing its oxidation into other compounds that do not have the same action when used as an indicator of reduction. It is pointed out that this can be avoided by using methylene blue thiocyanate instead of the chloride. This recommendation is made as the result of work carried on by 6 or 8 collaborators who have tested a batch of this salt made on a semi-commercial scale by the manufacturers. Thornton and Sandin [2, 3] also recommend that the tablets in the future contain 7.5 mg. each, giving a dilution of 1:300,000 in milk, thus agreeing closely with the Danish tablets on the market about 1922. A comparatively small batch of tablets conforming with these recommendations and consisting of methylene blue thiocyanate has now been made by the manufacturers. Tests are being made to make sure that they conform in every respect with specifications recently drawn up by the referee.

Both of these recommendations have been acted upon favorably by the Committee on Standard Methods of Milk Analysis and by the Coördinating Committee on Standard Methods; and they are now being referred by the former committee to the Laboratory Section with the request that they be approved.* It is believed that the American manufacturers, with their experience in making such tablets for 12 years or more, and with the additional advantage of Thornton and Sandin's investigations, will be able to put out a very uniform product. It is hoped that the standardization of these tablets, begun about 15 years ago, is fairly definitely completed.

* Approved by Section, New Orleans, Oct., 1936.

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Technic of Radio Broadcasting in Health Education*

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FIFTEEN years have witnessed the development of a new medium through which the public may be educated, coerced, and prodded into new habits and new ways of thought and action. Not since the invention of movable types by Gutenberg in the 15th century introduced the age of practical printing and universal reading has such a powerful, far-reaching and logical tool been placed in the hands of those who would mold public opinion. Health workers more anxious to influence the health habits of our people than to increase their store of information, will, I believe, find the radio playing an increasingly important part in their educational work.

The first thing to consider is the audience. The radio audience is not a unit—there are many radio audiences. Each hour of the day has several different audiences. The people comprising them are like molecules, first in one combination, later in the day in another combination with molecules of another sort, having lost certain of their earlier associates and associations in the change. There is the audience of housewives, and the audience of shut-ins. Later in the afternoon there is the audience of returning school children; and the housewives have become mothers. Later there are a variety of dinner audiences—young men and women who want only certain comedy programs, fathers who want music or silence, children who want the serial programs; the housewives who became mothers have now become wives. There is the Sunday morning "home and children" group, and there are the Sunday afternoon entertainment seekers. So it goes. A dramatic serial about two young lovers and their marital difficulties was a failure at night—husbands just did not like the sentimentality and the wives were a little ashamed of their interest in the program. But the sponsors were aware of this interest and transferred the program to mid-day. The housewives relaxing from their tasks loved it, and it became the second most important program during the day. The ideal is to find the program which attracts every audience—each individual. Since this is impossible, aim your program at the specific audience you wish to reach, style it for their approval. Do not think that all health programs should be the same type.

The next thing to realize is that your audience, psychologically, is not a group at all. It has seemed to me that most educators on the air directed their message to that vast audience of millions that is known as "the Radio

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Public." Only two or three people will be gathered around most of the radio sets tuned to your station. Not only is the group you are addressing small, but each person in that group must be reached as an individual. With a theatre audience you first try to reach its members individually, both through intellect and emotion. Then you try to mold them into a unit, with individuality lost or forgotten in the emotional climax. This marks success in the art. Not so in radio. Your listener there refuses to lose his individuality. You do not have him completely under your influence; you are not aided by mass reaction. He has too many distractions. He is in his own home where the habits of thought founded on environment are too strong.

So you must prepare your program for this individual. But is not this individual different from what he might be in another setting than his home? As psychologists and students of advertising well know, certain aspects of a man's self are brought to the fore when he is alone, others when he is part of a crowd, others again when he is acting as a member of the family group. It is the "member-of-the-family" self to which the broadcast message must be directed. And since the family is the oldest, most universal, and most permanent social group, and the one which health workers are most anxious in influence, we are fortunate in having at our disposal the medium of radio, and should use it widely.

There are two general types of radio programs: musical and dramatic. Under these two classes broadcasters group all programs.

For our purposes it is unnecessary to examine closely the musical programs, but in passing it is wise to note two points. The first is that music is the backbone of radio production. It is only the exceptional dramatic program which will draw the typical listener away from a jazz or symphonic orchestra. Musical programs hold their listeners on the first broadcast; dramatic programs build up their audiences slowly, week by week.

The second point is that in the excellent, commercially sponsored dramatic programs, music serves as introduction, "Curtains" and mood creator, to paint character and describe the scene. Since the message is to the ear alone, it is necessary that this be so. On many of the dramatic programs, musical talent costs are as great or greater than the dramatic talent costs. Over the air a proper musical setting is probably that which most often distinguishes a professional dramatic program from an amateur production.

When preparing a radio program, it is wise to ask yourself how this program will enter the home of your listener. Your listener will have the radio tuned to your station, and you will follow the preceding program; or your listener will spin the dial and there you are. In either case, your program enters as a guest: a guest who does not overstay his leave any longer than it takes to flick the dial; a guest whose welcome is in keeping with the pleasure he can give and the grace with which he offers it. More than any other, your program is a guest who cannot afford to break the commandments of good manners, the first of which is: Thou shalt not offend or bore.

Your program should present to your listener quietly and pleasingly that in which he, as an individual, is interested while he is a member of the family circle. You might write an article which he would read in a different mood, but if you simply presented the same article on the radio he would, with reason, be irritated by your conduct.

Perhaps the best model for a radio program is a good conversaton with no one trying to monopolize the floor,

or press for the acceptance of his views. Of course, a radio program does monopolize the conversation, but it can be so prepared that it leaves a feeling that your views and your listeners have both been well discussed and you both enjoyed the visit.

Writing for radio is quite different from writing a magazine article or news story. In reality, you are writing a drama, even if it is to be a talk by one speaker. He must act the part of the guest sitting in the opposite chair. However, the drama you are writing will only be heard, not seen. You must lend to your listener your eyes. You must, with words, bring to your drama color, light and shade, distance, texture, form, mass and weight, and taste and smell.

Health educators often must use statistics. Presenting such figures to the radio public in all their stark nakedness is little short of indecent. The listener puts you down as an intellectual snob. It is wise to present your statistics in a humanized version carefully described so your listener can picture them in his mind. When speaking of medical apparatus or technics, it is best to liken them to objects and methods with which your listener is familiar.

Another point to remember in preparing a radio program is that listeners may tune in at any point, and tune out also. For those coming in you must frequently repeat the gist of your introduction. For those leaving you must early in the program present your conclusions. But all this must be done without sacrificing the sustained quality of the program, for the listeners who sit through the entire program are the ones you are most anxious to please. Perhaps the best formula is that classic for a successful sermon: "Tell 'em what you're going to tell 'em; tell it to 'em; and tell 'em what you told 'em." It is more difficult to follow this formula in a radio play than in a radio talk, but with care it is still possible to allow for this "processional" part of your audience.

Another factor that causes difficulty in the preparation of a radio program is that of a definite time limit. This limit is measured in seconds, not minutes. Remember it only takes 10 seconds for an automobile going 20 miles an hour to transverse a city block. Ten seconds of silence on the air is more than enough time for the listeners to dial another station. Ten seconds too much script is the most useless thing in radio.

Timing a program means reading it aloud, not under the breath, but in the voice that will be used over the air, allowing for all pauses and parts of the finished program. And when it is timed, it should be timed again, and again, and again, until an average reading time is determined. It may take 3 hours or more to time a 15 minute script properly and make the additions or deletions which are necessary, if the program in production is to "hit right on the nose."

A stop watch is very helpful when timing programs, and it is valuable to jot down at the bottom of each page the time reached at that point. In this way it is possible to know in production whether the program is running slow or fast, and allow for the speeding up or slowing down of the presentation as required. At the end of the script it is helpful to have a few paragraphs that can be dropped if necessary without losing the sense. These should be outlined in pencil, or in some other fashion marked off from the rest of the script, and their time, in seconds jotted in the margin. In this way it is possible, when the script has gone too slow in production, to drop a paragraph or part of a paragraph and start with the closing remarks at exactly the right second.

Do not time a program by figuring on the number of words or the number of pages of manuscript. Speakers differ in the number of words they can read a minute, and every speaker will vary his own reading time.

Radio scripts should be typed on the softest paper obtainable as a protection against noise, and the finished script should never be folded or wrinkled. When a program calls for the sound of a raging fire, sound effects men may produce this noise by crumpling paper before the " mike." You can see why it is important to exert every effort to prevent the rattling and crackling of scripts. Some radio stations even go so far as to type their scripts on a processed cloth. Many studios use a wax-filled paper. These special types of paper are well worth their slight extra cost.

Scripts should be typed with one or two spaces between lines, and an extra space between paragraphs or between the lines of different characters in a play or interview. They should of course be typed only on one side of the page. The large pica type should be used. Each paragraph should be complete on a page. Never run a paragraph over to a second page; rather use but half of one page and start the new paragraph on the next page. The same is true of each speech of a character in a play. If an actor must turn a page in the middle of his speech, he is almost sure to show it by hesitation in his voice. Another point: the words at the end of each line of the script should be complete; do not hyphenate them, but put the entire word on one line or the next. Smoothness of reading is necessary if the script is to sound like natural conversation in production.

Scripts can be handled easily if the sheets are not clipped together by carefully sliding off the used sheets and placing them behind the others or on a table that is handy to the speaker. Another good method is to put the script in a folder with the last page clipped to the folder top and bottom, and the other pages clipped at the bottom. In this way the pages are turned down, and cannot fall back as they often do if the script is clipped at the top. The pages turn with less noise and the script is easy to handle.

The straight talk is the simplest and most foolproof program. In such talks it is best to personalize your message by illustrating your points with human interest stories of people who are similar to the members of your audience. Bring your message home. Do not tell these stories as if they were case histories, but tell them as if you were discussing with your listener the problems of a mutual friend. Many a successful commercial program is no more than a straight talk, but one filled with human anecdotes.

Fifteen minutes on the air is a long time, and only a good radio speaker can hold the attention of his listeners for so long. It is therefore often wise to use two speakers on such a program, chosen to give a contrast in voices, personalities and opinions. In using 2 speakers, or 3 speakers on a half hour program, it is a good technic to have them tell one story between them, in order to connect the speeches, with the second speaker continuing the story or retelling it from a different viewpoint.

The interview form of program is effective, particularly when it develops into a discussion with the drama of conflicting ideas. In such a program 1 or 2 persons may be interviewed. The interviewer directs the questions and trends of the discussion. The interviewer is the audience personified. He should presumably know no more about the subject than your listener, be anxious to learn, yet quick to detect loose thinking or mistakes in the reasoning of the authorities he is questioning. The interviewer must satisfy

the ego of the listeners; he must say some of the clever things that pop into the head of the listeners; and he must occasionally trip up the bigwigs. All this without lowering the interview to the level of a hot argument, or disrupting its serious purpose. Such a program must be spontaneous, and, though this seems a contradiction, must be as carefully prepared as a radio play. Every line, every word, every clever spontaneous remark must be written beforehand, and the whole carefully rehearsed.

Do not confuse the question-and-answer program with the interview or discussion program. The two are not the same. The question-and-answer program is usually just an excuse to get 2 voices on the program, though occasionally it may be an effective form for presenting certain material. It has the advantage over the straight talk in that the points are sharply defined, and the answers, as it were, underlined. However, it lacks drama, and unless the listener is interested in the very questions asked, he will find little of general interest. This type, too, when used to present questions dealing with the diagnosis or treatment of disease, will too often resemble the program of the quack, and will draw letters impossible to answer, letters asking for diagnosis or prognosis of the ills of the writers.

We now come to the plays, or true dramatic programs. However, in passing, let us mention a transition type, the straight talk with dramatized sequences. In this form, the speaker may introduce a story; his voice then fades out and actors present a short scene. This type is used in many commercial programs and is very effective.

Similar to this is the use of other voices to present quoted statements, voices suggesting the authors of the statements. There is the typical doctor's voice, the lawyer's voice, the housewife's voice, the foreign scientist's voice. Using this type, the narrator may say, "as the eminent Viennese scientist, Dr. Von-Something-or-other, has said," and then the eminent doctor's voice-double gives the statement. Another use of this technic is to have 2 voices, distinctly different, alternately present points in a list of related statements, such as a set of health rules.

In a radio play, an announcer may introduce the program, set the stage, and change the scenes. It is better, however, to limit the announcements as far as possible, and let the lines of the characters describe the scenes. If you would write a radio play, study those which are presented by commercial sponsors—"One Man's Family" is one of the best of these. Through the study of Shakespeare's plays, you will find how the lines of characters may set the stage—stage settings as we know them were unknown in his day. Most of the Shakespeare plays simplified to their basic plots and characters, are extremely effective as radio dramas.

The number of leading characters in a radio play designed for a 15 minute period should be 3, and there should not be many minor characters. In a serial drama the number may be increased, though no more characters should appear in any one production. This is not a hard-and-fast rule, but a good one. Radio listeners find it difficult to separate many characters to whom they have just been introduced.

A change of scene is effective and refreshing and may occur several times in a 15 minute script if the scenes have a logical sequence suggested by the plot, so that the listener anticipates the change. But change for no good reason adds nothing but confusion to a script.

One might at some length describe the method by which characters are developed in a radio play, but trial and the thoughtful study of stage plays and radio plays is the best teacher. If

you are interested in this type of program, you should visit the most important radio station in your area and beg of them a few scripts of commercially sponsored radio dramas. Then you will be able to study the style of the professional in writing radio plays.

In my opinion plays are the most effective type of program for presenting health information, and certain surveys have revealed them to be the most popular with radio listeners of all the dramatic forms. A study by Dr. Turner of the Massachusetts Institute of Technology, and two of his associates, revealed that plays, questions-and-answers, talks and dialogues, in the order named, were the types of health broadcasts preferred; but plays are the most difficult to produce of the 4 types of programs. Many radio stations prefer that educators stick to talks, for fear that their more pretentious efforts will fail. For a radio play to succeed, it must be well acted by competent players, carefully rehearsed and produced with all the trimmings of music and sound effects. I would advise no health workers to attempt to produce radio plays unless they have the time and the talented performers necessary to do a good job.

In the production of programs, the staff at any station will guide the beginners and carefully watch over the more experienced. They will tell you the distance from the " mike " to stand, the voice level to assume, how to fade in or out in plays. The sound effects man will usually be on deck if you need him, and all he will require is an extra copy of the script with the sound business marked in it at the right points. If you are producing a play, however, the effects you want to get over, the speed of the production, and the degree of emotion that is to be put into the reading of the lines is up to you. It is wise to have a producer for such a program, either yourself or some other, who is not acting or announcing and is free to listen to the program from the control room and make the changes in accent that mark a well produced play from a sloppy production. It is wise, too, to have a producer for the other types of programs, to keep check on the speed and to help the speakers over their nervousness.

Actors for a radio play are chosen entirely by their voices. Radio station production managers never see their actors while casting a play, they only hear them. A voice does not always suggest the person of its possessor. The little boy you hear on the radio may be a woman of mature years and tremendous size. With experience you can to a degree pick voices without hearing them on the " mike "—at least you can tell generally whether they will be good or bad and the type of voice. But when you hear them over the " mike " you will find that frequently you have been mistaken and the person you had in mind will not do at all. It is therefore wise to cast a play well in advance, with tryouts at the studio.

It is equally important to try out the voices of speakers for the simpler types of radio programs, since 15 minutes of an irritating voice is rather hard on the radio listeners—or would be hard if they would listen. I know it is not always possible to bring a proposed speaker around to the station days in advance and try his voice—and it is even harder to tell him he will not do after he has counted on presenting the talk and told all his friends, and when he may be your superior in your professional field. But remember this, you might just as well have no program as a poor one.

When first picking your speakers, remember that the biggest names among health workers are usually no better known to the radio public than those who are at the bottom of the

ladder of fame in their profession, and those at the bottom usually have more time to work on programs, are more willing to take suggestions, and are more apt to turn out a true, dramatic radio program than a scientific address designed for their peers, or an elementary talk that makes the radio listener feel he is being given crumbs by the mighty sitting around the table of science.

Radio is the most potent medium at our command through which we may reach the people of this country, give them the information we have at hand, and motivate their actions toward a new way of life.

Radio time is available to us, or can be made available for our use when we can show sufficient public interest in our work, or can show unification of health groups sufficient to end the conflict of educational policies and information.

Better radio time will be available when we are able to produce programs of a professional quality, entertaining to and desired by the public. In attempting to reach this last goal, we can do no better than to study the productions of commercial radio sponsors, for they at least know better than we the desires of the public. After all, the public has paid them well.

Do not think that all we need to do is sugar-coat our information. That is begging the issue. If our radio programs fail it will not be because of the public's lack of interest in anything but the froth of human knowledge, but because we are ignorant of the technics of radio production and because we lack imagination.

Domestic Servants and Syphilis

NORTH CAROLINA has enacted a law requiring all domestic servants to be examined for the presence of syphilis and other communicable diseases. A summary of the Act from May, 1937, *Health Bulletin* follows:

Section 1: That hereafter all domestic servants who shall present themselves for employment shall furnish their employer with a certificate from a practising physician or the public health officer of the county in which they reside, certifying that they have been examined within 2 weeks prior to the time of said presentation of said certificate, that they are free from all contagious, infectious, or communicable diseases, and showing the nonexistence of any venereal disease which might be transmitted. Such certificate shall be accompanied by the original report from a laboratory approved by the State Board of Health for making such tests showing that the Wassermann or any other approved tests of this nature are negative. Such tests to have been made within 2 weeks of the time of the presentation of such certificates, and such certificate shall also affirmatively state the nonexistence of tuberculosis in the infectious state.

Section 2: That all domestic servants employed shall be examined at least once each year and as often as the employer may require, and upon examination shall furnish to the employer all of the evidence of the condition of their health as is set out in section one hereof.

Section 3: All laws and clauses of laws in conflict with this Act are hereby repealed.

Section 4: That this Act shall be in full force and effect from and after its ratification.

Points of Interest in a Survey of Maternal Mortality*

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THE number of women who die from causes directly attributed to pregnancy and childbearing is excessive. An unnecessary loss of life continues despite the fact that the leading causes of death (sepsis, hemorrhage, and toxemia) are largely preventable; and there is little evidence of a declining mortality which apparently should follow improved facilities and methods for the care and management of obstetrical cases.

Realizing that a knowledge of the circumstances under which deaths occur is essential to the introduction of measures capable of reducing mortality, the Board of Health and Medical Society of Jefferson County, Alabama, jointly undertook a 5 year study of maternal mortality in an effort to determine what proportion of deaths could be prevented, what persons and conditions were responsible.

This study, covering the years 1931–1935, is based on 39,361 live births, 1,925 stillbirths, and on clinical histories of 329 deaths of which 277 were shown to be maternal. The full report [1] is necessarily detailed and statistical, and we wish here only to generalize on some of its more interesting phases. Possibly this information may prove useful to other communities in which similar conditions prevail.

After the accumulation of data, it first became necessary to establish true mortality rates on the basis of the additional information, and then to assign to the proper parties the responsibility for those deaths judged as preventable.

ERRORS IN MORTALITY RATES

The official maternal mortality rate for the full period of study, based entirely on information obtained from death certificates, was 8.3 per 1,000 live births. The true rate as determined from clinical data was 7.0. Of the several factors which led to error in calculating maternal rates the most glaring were the gross inaccuracies of attending physicians in certifying the cause of death. Physicians have themselves to blame that official rates do not reflect actual conditions, and in this instance were 18 per cent too high for the period of study. Actually, only 70 per cent of all deaths could be properly classified on the basis of information furnished by the death certificates. Mortality rates, already abnormally high, were pyramided by the inclusion of many fatalities not associated with pregnancy. Too often, the physician fills out a death certificate

* Read before the Health Officers Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

contrary to his best knowledge and judgment. This is unquestionably due to his failure to appreciate the value of such certificates, and as a result he often cares little about accuracy. Instances of wilful misrepresentation of facts, in order to cover up gross errors in judgment or technic, were extremely rare.

RESPONSIBILITY FOR PREVENTABLE DEATHS

Among the maternal deaths 18 per cent were judged to have been non-preventable. These include deaths of women who sought medical care without considerable delay, and who were promptly treated in the accepted manner. Two hundred and eighteen, or 78 per cent, of the fatalities were judged by a committee of obstetricians to have been preventable. For these, responsibility was placed as follows:

Patient	50%
Physician	40%
Midwife	3%
Divided, or undetermined	7%

The 108 cases in which women were responsible for their own death represent, in their order of importance: (1) failure to obtain medical care at the time of abortion or delivery, (2) failure to obtain adequate prenatal care, and (3) self-induced abortion. The physician is practically helpless in such instances, for the patients, disregarding signs of impending danger, fail to seek medical care until seriously abnormal. Under such circumstances it is not surprising to learn that only 18.5 per cent of all fatal cases had adequate prenatal care as judged by the minimum standards adopted by the U. S. Children's Bureau.

Abortions accounted for one-fourth of all deaths. The fact that 98 per cent of these cases were desperately ill from sepsis or hemorrhage when a physician was first called is fair evidence that many were the result of illegally performed operations. Such cases represent social problems primarily, and medical problems only secondarily. The frequency with which self-induced and criminal abortions are performed is not so much a result of illegitimate pregnancies as it is a direct corollary of economic and social conditions among white married women.

Chronic diseases often complicate pregnancy, and the frequency with which they appear on death certificates, as joint causes of death, emphasizes the importance of a thorough medical examination before pregnancy is undertaken.

Physicians were judged responsible for a death when it was shown that they exercised neither the degree of learning and skill, nor the usual care and diligence in the performance of their duties, that would be expected of a practitioner of modern obstetric science. On this basis physicians were judged responsible for 40 per cent of all preventable deaths. Errors in judgment and technic represent largely a failure to recognize and treat complications promptly; wrong choice of an operation; unnecessary operative interference; operating without proper safeguards such as transfusion in a case of bleeding from placenta praevia; failure to maintain asepsis; and failure of the doctor to recognize his own limitations in not obtaining consultation, or in performing an operation for which his training and experience did not qualify him. In a few instances gross neglect on the part of the physician resulted in death of the patient.

It would be interesting, if possible, to determine what individual physicians, or what class of physicians were largely responsible. Data obtained on 9 individual physicians with large obstetrical practices are shown in Table I, and appear reliably to represent mor-

tality trends. In calculating these rates the physicians were not charged with all maternal deaths occurring in their practices, but only those for which they were judged responsible.

to constitute a grave hazard for the patients they attend. Their practice will continue until some way is found to bring medical service to the remote communities and the poor. That the

TABLE I

The Practice of Certain Individuals

	Live Births			Maternal Mortality Rate *	Stillbirth Rate *
	Number	Per cent Negro	Per cent Hosp. Del.		
3 Obstetricians	1,718	1	85.0	0.6	26.2
3 Practitioners, White	833	28	6.2	3.6	21.6
3 Practitioners, Negro	1,431	100	0.4	2.8	57.3
All Midwives	1,372	82	0.0	4.4	61.2

* Deaths per 1,000 live births

It will be noted that 3 obstetricians had far fewer deaths of mothers than did 3 general practitioners though the latter maintained a slightly lower stillbirth rate. Three Negro practitioners lost fewer mothers than the white practitioners though their stillbirth rate was considerably higher, as would be expected in Negro practice. A white general practitioner with the largest obstetrical Negro practice is not included in the above table. He maintained a maternal mortality rate equal to that for all midwives while his stillbirth rate was 50 per cent higher than that for midwife deliveries.

With the exceptions noted, and excepting the practice in hospitals with closed staffs, practically all other deaths occurred in the practice of physicians who do very little obstetrics. The inability of these physicians to deal successfully with abnormal cases because of their very limited experience accounts in a large measure for the remaining deaths.

Midwifery, fortunately, is no great problem to Jefferson County for the practice is largely emergency in character, and is confined almost entirely to Negroes. The general education and mental ability of midwives are so low as

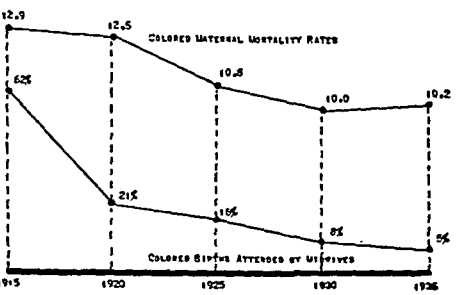
elimination of midwifery has brought surprisingly little improvement in colored mortality rates is shown in Figure I. This indicates that, even with the extension of medical service to the vast majority of colored women at the time of delivery, the problem of maternal mortality among Negroes has in no way been solved.

Medical care given to colored patients is inferior to that for the white and this has contributed to a higher death rate. Errors in judgment and technic, and neglect on the part of the attending physician were 50 per cent more frequent among the colored mothers.

NEGRO MORTALITY

An analysis of maternal mortality rates by color shows a Negro rate 78

FIGURE I



per cent higher than the white. In general, the same factors which produce a high white rate also operate, but to a much greater extent, to produce a higher Negro rate. We find that the frequency with which deaths occur among Negro women is higher than the white by 80 per cent for sepsis, 95 per cent for hemorrhage, 95 per cent for toxemia, and 32 per cent for all other maternal causes. The frequency with which intercurrent diseases occur, and serious preëxisting diseases are found, are also greater by 32 per cent among the colored.

When these rates are further itemized according to the various preventable factors we find that the colored rates exceed the white in practically every instance. Among the Negroes, ignorance was the more frequent preventable factor by 42 per cent, failure to obtain suitable delivery or abortion care by 170 per cent, and failure to obtain adequate prenatal care by 300 per cent. On the other hand, self-induced abortion, as a cause of death, was 133 per cent more frequent among the white.

HOSPITAL PRACTICES

Within recent years medical literature has focused attention upon the comparative safety of deliveries in the home and in the hospital. The issue has merit. In expert hands and amid proper hospital surroundings the risks attached to childbirth are materially reduced. Despite this fact, our maternal death rates have not been materially lessened, although the percentage of deliveries occurring in local hospitals has noticeably increased.

Since all of our important hospitals are on the approved list of the American College of Surgeons, and all provide reasonably adequate physical equipment, the explanation of these continued high rates must be sought either in the condition of the patients admitted, or in the ability of medical attendants in hospital practice.

The per cent of abnormal obstetrical cases admitted to hospitals is high (72 per cent as compared to 39 per cent for home deliveries), though with an increasing percentage of hospital deliveries there is reason to believe that the relative number of abnormals admitted is decreasing. In short, it appears that the responsibility rests upon the medical attendant, and the failure of mortality rates to decline is in no small part a reflection upon the obstetrical skill and judgment of the hospital attendant.

The safety of the patient, of course, rests primarily upon the ability of the attending physician, regardless of the place of delivery; and in the hands of a competent physician any abnormal case can always receive better care and experience less danger in a hospital than in the home. It is equally apparent, however, that in the hands of the incompetent the danger is often greater in hospital practice because of the opportunities afforded the attendant to perform operations for which his training and experience do not qualify him.

Until hospital authorities provide adequate measures to elevate obstetrics as practised in their institutions to the level of generally accepted standards, increased hospitalization of obstetrical cases will not materially reduce the number of fatalities. Regardless of whether institutions maintain an "open" or "closed" staff their failure to supervise obstetrical practice deserves criticism. They must know the character of work done by their visiting staff of physicians, must require adequate consultation in difficult cases, and must provide ways and means for residents and internes to receive adequate instruction and practical experience.

Considerable doubt has been ex-

pressed by physicians concerning the reliability of much of the published data regarding hospital statistics, and rightfully so. Death rates cannot be calculated merely from information obtained from death and birth certificates. Complete clinical histories of all fatalities are necessary before one can judge whether the error leading to death occurred in the hospital, or through some fault of the physician or the patient before admission. In the discussions that follow hospitals have been charged only for those deaths in which an error in judgment or technic occurred after admission. Decisions were based on clinical histories, and in most instances the circumstances were so clear as to leave little difficulty in identifying the responsible party.

Of 87 preventable deaths for which physicians were held responsible, the break or error leading to death occurred in hospitals in 50, or 57 per cent, as follows:

Neglect at or following delivery	3
Errors in technic	15
Errors in judgment	29
Errors in both technic and judgment	3

In some instances there was carelessness or neglect on the part of internes who, without making postpartum observations, allowed cases of hemorrhage to die without attention; in other instances inexperienced internes, without supervision, performed operative obstetrics for which they were not qualified; in still other instances attending physicians were entirely responsible through failure to exercise proper judgment and skill.

TABLE II

Incidence of Obstetrical Operations in Various Hospitals *

	Caesarean Section	*Version Extraction*	*Forceps*	*Total*
	%	%	%	%
Highest	8.4	27.0	33.9	65.6
Lowest	0.9	3.5	4.7	11.2
Average (6 hosp.)	2.4	11.0	17.9	32.1

* Based on 15,505, or 93 per cent of all hospital live births.

OPERATIONS

The incidence of obstetrical operations performed in all hospitals during the period of study has varied only slightly from an average of 310 per 1,000 live births. The incidence among various institutions, however, differed considerably, as shown in Table II.

The incidence of deaths for which hospitals were judged responsible varied from 0 to 0.42 per cent, while strictly operative deaths varied from 0 to 0.21 per cent. One hospital had the highest incidence of total hospital deaths, operative deaths, and sepsis deaths while another hospital had the lowest incidence of all 3.

As regards caesarean sections the following conclusions are justified: (1) caesarean section is often done for no valid reason; (2) definite contraindications for operation are often disregarded; (3) a reasonable degree of technical skill is sometimes not possessed by the operator; (4) adequate consultation is often neglected; (5) proper pre-operative preparation is occasionally neglected; (6) poor surgical judgment is occasionally shown during the actual operation. Death rates for various operations are as follows:

Caesarean section	2.1 per cent
Version extraction	0.4 per cent

These rates are for operations performed in hospitals and include only those deaths for which the operation itself was judged responsible for the death. They represent cases in which the operation was improperly performed or in which the wrong operation was selected. Corresponding rates for home deliveries are not available.

However, a total of 8 per cent of all maternal deaths were directly attributed to operations improperly performed.

One result of the high frequency of operations in hospital practice is to increase sepsis rates which at best are as high as those for home deliveries. Table III shows the sepsis rates for both home and hospital deliveries as well as many other factors which influence the development of sepsis.

TABLE III

Practices at Delivery Which Influence the Development of Sepsis *

	Hospital Deliveries	*Home Deliveries or Deliveries Attempted at Home*
Sepsis mortality rate (per 1,000 live births) †	0.90	0.84
	Per cent	*Per cent*
Patient abnormal when first seen (but not septic)	72	39
No physician or nurse to assist at delivery	0	75
No preparation of patient for delivery (neither shaved, nor sterile goods used)	2	67
Operative deliveries	74	41
Membranes ruptured artificially	19	8
Two or more vaginal examinations made	14	18
Rubber gloves not used	0	7
Pituitrin used in 1st and 2nd stage	2	7

* Based on 160 deliveries attended only by physicians

† Based on 16,633 home and 22,728 hospital live births, and including only those deaths from sepsis for which physicians were judged responsible

REMARKS

Upon the physician rests the greatest burden of responsibility for reducing the incidence of preventable deaths in obstetrics, yet a reasonable amount of responsibility looking toward the prevention of deaths from maternal causes is an inescapable and mandatory duty of the general public, and all agencies interested in health and welfare.

Ultimately the accomplishments attained will result largely from a process of "push-and-pull" between the medical profession and the public—the profession offering expert care, and the public demanding that it be given.

The place of public health (whether federal, state, or local) in this program is definite and important, and includes (1) full coöperation and encouragement to the medical profession, (2) wide and constant educational programs and (3) as finances permit, assistance to indigents by furnishing medical care.

Educational programs directed to the individual case through the public health nurse are more important than sporadic efforts directed through the press, or to interested welfare groups. Women should know what constitutes adequate prenatal and delivery service and should be able to discriminate between the physician performing obstetrics "by chance" and the one performing such duties "by science." All clinics and hospitals rendering maternal services must be directly supervised by competent and well seasoned obstetricians. Opportunities for the teaching of general practitioners in these centers should be fully utilized. The services offered must go beyond the administration of prenatal care and must include supervision, assistance, and consultation in actual deliveries. Our local problem cannot be touched by providing prenatal care alone, for in our studies 67 per cent of all abnormalities causing death developed with the onset of labor or subsequent to it.

Finally, whatever efforts are directed toward the reduction of mortality, faith of the public in the integrity of the medical profession must be carefully guarded and fully maintained.

REFERENCE

1. *Maternal Mortality in Birmingham and Jefferson County, Ala.*, Joint report of Jefferson County Medical Society and Jefferson County Board of Health. June 1, 1936.

The Need of Uniformity of Conditions for Counting Plates

With a Suggestion for a Standard Colony Counter

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IN the quest for the sources of error to which bacteriological plate counts of milk, water, and other materials are subject, comparatively little attention has been directed to the need of *standardization* of the conditions under which the counting of the colonies on the plates is performed. It must be evident, however, that uniform counts of a plate cannot be expected if a variety of types of illumination and a diversity of magnifications are employed.

Perhaps the principal reason for this unconcern has been the assumption that variations in conditions of counting give rise to variations in counts which are only of minor importance. That *gross* discrepancies between counts of the same plate may result from the use of different types of illumination of the colonies, that even well designed counting devices which employ different methods of lighting may yield very discordant counts, is apparently not generally recognized. Two recent practical experiences of the authors, which doubtless are similar to those of others who have had occasion to compare counting devices, are suggestive. In one instance the bacteriologist of a water purification plant questioned the accuracy of very high plate counts reported by the Provincial Laboratory, contending that his own counts were all very low. Examination of his plates by means of the counter to be described readily revealed the presence of large numbers of colonies which he had not detected. In the other instance a dairy laboratory reported a series of counts from duplicate milk samples which were consistently lower than those obtained by the Provincial Laboratory; the dairy laboratory was using a well known type of counter which employs only reflected light. When this counter was compared with the other, it was found that many colonies, and some of considerable size, which were plainly visible by the combination of transmitted and reflected light of one counting device, disappeared entirely when viewed by the reflected light alone of the other. In each of the instances described, the sole cause of the discordant results was a difference in the conditions of illumination of the plates.

Different magnifications also may be expected to yield different counts when very small colonies are present. For many years past *Standard Methods of Water Analysis* has specified, for plate counting, the use of a lens magnifying

approximately 2½ diameters. *Standard Methods of Milk Analysis* recommended, but did not specify, the same lens until 1934 when, in its Sixth Edition, a lens magnifying "at least 1½ diameters" was recommended. This permission of the use of a lower magnification very properly recognizes the present-day preference of laboratory workers for the ordinary reading glass of wide field and of easy manipulation. In the interests of economy and convenience, as well as of uniformity of performance, it is advisable that one specified lens of low magnification be substituted for the variety of lenses now in use. An auxiliary lens of considerably higher power is required occasionally to distinguish between colonies and extraneous material; but the primary magnification, which really determines the order of the count, should evidently be standardized.

For the purpose of developing an extremely simple counting device which would offer, if not the best, at least very satisfactory conditions of illumination, magnification, and convenience, and which might serve as a suggestion for an initial effort to establish uniformity of counting conditions, the authors undertook an extensive study of the essentials of a practical colony counter, with particular regard to its illumination. A number of counters were made up and compared; both routine water and routine milk plates served as material for examination.

The indications furnished by this study were then incorporated in a design for a counter, three of which were made and used for routine counting for several months and found satisfactory. This design was then submitted to the Referee * for Methods of Counting Bacteria in Dairy Products (Committee on Standard Methods) who had several of the counters constructed and distributed to various laboratories for trial.

Following the receipt of favorable reports concerning the utility of the apparatus, the aid of a manufacturer † was enlisted for the construction and distribution of the device at a reasonable price. Both the Referee and the manufacturer contributed further improvements to the design, and the final result is the "Quebec Colony Counter" described below. No marked originality is claimed for this counter, but it is believed that it combines the essential features which make for constant magnification and illumination, for the convenience and comfort of the operator, and for accuracy of counts.

MAGNIFICATION AND ILLUMINATION

Magnification—The lens chosen for the counter is an ordinary 4½" reading glass magnifying about 1½ diameters. As this lens provides a large field of vision which includes the whole plate (100 mm.), its use does not necessitate continual readjustment of the position of the operator.

It is admitted that a magnification greater than 1½ diameters would be somewhat preferable, but pending development of a low-cost lens which, while retaining the advantage of a wide field, will furnish greater magnification, the type chosen should suffice.

Illumination—Constant lighting conditions are obtainable only with artificial illumination; and since electric lighting, the obvious choice, necessitates the use of a box-form of counting device, a variety of frames, types of lamps, and mirrors to reflect the light were included in numerous designs of such counters, in order to determine the most satisfactory method of illumination. From this study certain conclusions were apparent:

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† Spencer Lens Company, Buffalo, N. Y.

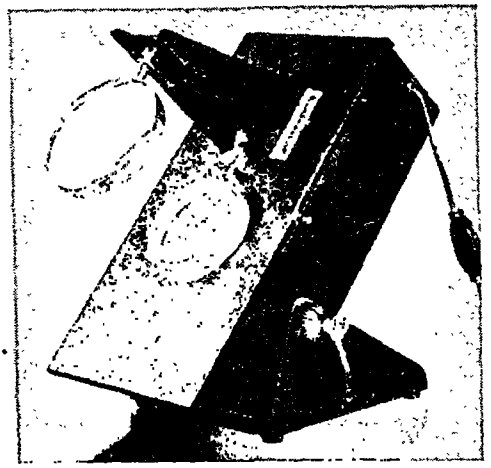


FIGURE I—Quebec Colony Counter

1. Reflected light alone is insufficient. Certain types of colony that are quite readily visible by transmitted light are invisible by reflected light.

2. The combination of transmitted and reflected light provided by placing the source of illumination behind, and at one side of the plate is undoubtedly the best.

3. No direct rays or glare from the filament or lamp bulb must be permitted to reach the eyes of the operator.

4. Lamps placed on 3 or 4 sides of the plate, however disposed with regard to their distance from the plate, or with reference to the plane of the plate, fail to provide satisfactory illumination.

5. Two lamps, disposed at opposite sides of the plate, give the best illumination. A mirror may be substituted for one of these lamps with practically identical results. (It is interesting to observe that this disposition of a light source at one side and a mirror at the other is the type of illumination recommended by Graf[1] in a counter described many years ago. In this counter the mirror was adjustable, and the background was shielded from direct rays of the lamp.)

It remained—for the purpose of standardization of the illumination—to fix the exact positions of the light source and of the mirror, to specify the dimensions of the frame, and to specify the intensity of the light and the character of the reflecting surfaces of the box interior.

The positions of the light source and the mirror are largely determined by the relative positions of the window and the magnifier. The direct rays and glare from the lamp and mirror passing through the plate, must barely clear the outer circumference of the magnifier, if the maximum effect of the light is to be secured and if intense light is to be kept from the eyes of the operator. The exact arrangement was decided by experiment.

The simplest and smallest box, or frame, compatible with the determined positions of the lamp and mirror, was chosen, in order to facilitate home construction of the apparatus and to reduce the bench space occupied by it to a minimum. The improvement effected by shielding the bottom surface (background) from direct light rays did not appear to compensate for the additional construction and the greater dimensions of frame necessitated.

The ordinary 60 watt frosted Mazda lamp was found to furnish ample light. A dull black coating for the interior surface of the box opposite the plate, and aluminum paint for the other in-

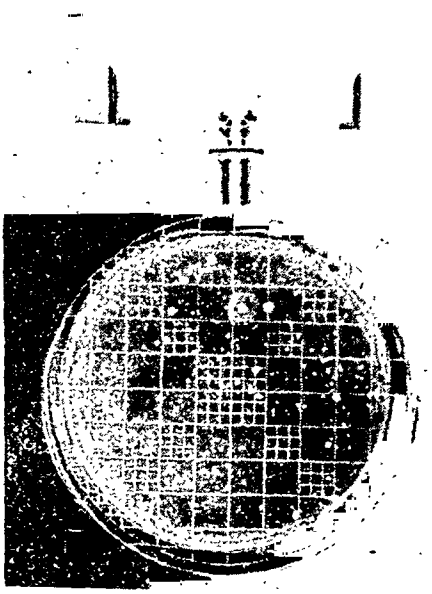


FIGURE II—Quebec Colony Counter. Plate in Position for Counting.

terior surfaces complete the conditions desired.

With the illumination described, an effect similar to that provided by a darkfield condenser equipment is obtained, and the colonies stand out sharply against the dark background. With both light source and mirror fixed, constant illumination of every plate counted is insured.

ESSENTIAL SPECIFICATIONS OF COUNTER

Frame or Box—Inside dimensions: Length, top, 15¼"; length, bottom, 13½"; width, 7¼"; depth, 4¼". The end which supports the lamp socket forms right angles with top and bottom; that which supports the mirror forms an angle of 113° with the bottom.

The interior bottom surface is painted dull black, all other interior surfaces with aluminum paint.

The window which permits illumination of the plate is 4" in diameter and is placed midway between the sides of the frame. The lower circumference of the opening is 4¼" from that end of the frame which supports the mirror.

The top of the frame is hinged to facilitate dusting of mirror and reverse side of ruled glass plate; and both ends are provided with openings to permit ventilation.

Light—An ordinary 60 W—120 V Mazda lamp (bulb: standard lighting A 21) is centered midway between top and bottom and between the sides in such a manner that the filament is 4¼" from the end of the frame which supports the lamp socket.

Mirror—A plain mirror 4¼" x 5½" rests on the interior surface of the opposite end of the frame.

Magnifier—A reading glass, 4½" in diameter, magnifying approximately 1½ diameters, is mounted in such a manner that it may readily be adjusted to suit the vision of the operator.

Ruled Plate—The ruled glass plate is supported inside the upper surface of the frame and flush with it, so that the Petri dish is supported by it.

Certain features (included in the manufactured article) which add considerably to the convenience of the counter are a device to permit centering of Petri dishes of different diameters, an adjustable mount to permit centering (or removal) of the magnifier, and a hinged support to allow adjustment of the frame to any position from the horizontal to the vertical.

ADVANTAGES OF THE COUNTER

The principal advantages of the counting-device described are the following:

1. Constant illumination and magnification are provided.
2. The counter can be used in any position, from the horizontal to the vertical; the operator may assume an upright, comfortable posture when counting plates.
3. The magnifier in its fixed position permits a view, in focus, of the whole plate; as a consequence, eye strain is eliminated.
4. As no direct rays of light can pass through the magnifier, the operator is protected from disagreeable glare.
5. The working distance between the lens and the Petri dish is so great (about 6") that there is ample space for insertion of an auxiliary occasional lens, or for manipulation of a needle if colonies are to be fished.
6. Wolffhuegel, Jeffer, or Stewart ruled plates may be used interchangeably with the apparatus.

REFERENCE

1. Graf, A. V. A New Bacteria Counter. *J. Am. Water Works Assoc.*, 21:1531–32, 1929.

NOTE: The authors express their very grateful acknowledgment to A. H. Robertson, Referee for Methods of Counting Bacteria in Dairy Products, Committee on Standard Methods; to H. N. Ott, Spencer Lens Company; and to the many laboratory workers who have tried out the device described, for their kindly interest and coöperation in its development.

The Laboratory Diagnosis of Amebiasis*

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THE laboratory diagnosis of amebic infection is in a very unsatisfactory state at present, not because there is anything inherently lacking in the procedures available, but because of the universal lack of training among laboratory personnel for this type of work.

This, together with an equally widespread lack of understanding and appreciation of the situation on the part of everybody concerned, is productive of such a high percentage of unreliable reports, and their blind acceptance, that the situation is worse by far than if no laboratory tests at all were made in many, perhaps, most cases.

The above statement is made advisedly, but lest it appear to be overdrawn, a few reasons for pessimism will be cited. A doctor from a town of about 20,000 in discussing a paper at the County Medical Society, related the recent occurrence in his practice of some 20 cases of amebic dysentery among children. His diagnosis was based on the reports from a commercial clinical laboratory run by a man of many years' experience and possessing the confidence of the medical profession in his community. Those who are familiar with the epidemiology of amebic dysentery will not need any laboratory evidence to convince them of the erroneous nature of the reports of this laboratory in so far as amebic dysentery is concerned.

A certain large hospital, the laboratory of which is presided over by a competent general pathologist, has on the laboratory staff a "parasitologist" of many years' practical experience who has twice failed to pass the state examinations.

A physician in a smaller city reported several cases of amebic dysentery diagnosed by a local laboratory. Investigation by the State Department disclosed bacillary dysentery and not amebic.

Such occurrences must be common everywhere; indeed, the opinion that they are the rule and not the exception is inescapable in the light of what follows.

In California state examinations for certificates of proficiency in parasitology, the number of applicants during the past 3 years was 214, of whom 79, or 37 per cent, passed and 63 per cent failed. This in itself may seem disturbing since the examinations are as simple, fair, and practical as it is possible to make them, consisting as they do principally of the identification of material under the microscope.

Furthermore, these applicants come from laboratories, often with years of practical experience behind them; some have had courses in schools for technicians and some are college graduates with a major in zoölogy and courses in protozoölogy. All are confident of their ability to recognize and identify in-

* Read at a Joint Session of the Laboratory, Food and Nutrition, and Public Health Engineering Sections of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

testinal protozoa and to be generally competent in a clinical diagnostic laboratory. But when the training and experience of the applicants is inquired into, the outlook for a dependable supply of technicians in this field is alarmingly uncertain.

An analysis of our data with respect to the previous training and experience of these applicants shows that there is only one way to become proficient and that is by a direct course of training under a competent protozoölogist, and this course is preferably an intensive one without admixture with other activities during its continuance.

Of the 214 persons referred to, 133 were college graduates and 81 were not. Of the college graduates, 22 had no other advantage and of these only 2, 9 per cent, passed, showing that college alone, even with academic courses in protozoölogy is not sufficient. Of the 81 non-college people, those who had only practical experience numbered 39, of whom only 2, 5 per cent, passed, showing that college alone is a little better than experience alone, and that experience alone is worth practically nothing.

A combination of the two is, however, worth a little more. In this group of 34 people, 14 per cent passed. Those who had some sort of technicians' course such as in private training schools or in a teaching hospital laboratory, or a university extension course designed for technicians, plus practical experience, and in most instances also a college degree, scored 36 per cent of successes. The best group of all was made up of those who had the advantage of an intensive course of the type mentioned, in addition to practical experience. In this group there were 39, of whom only 2 failed.

Needless to say, there has been disappointment and criticism of the examinations. One of the commonest is that the worker is familiar with and is competent to examine fresh preparations but is not familiar with fixed and hematoxylin stained slides as used in the examination. Our answer to this will be found in the writings of the leaders in this field, and quotations from James and from Dobell will serve as examples. James says:

> Personally, in doubtful cases, I no longer accept my own findings based only on fresh material, and rely for the final determinations exclusively on wet, fixed and stained preparations. . . . This determination can be made with a very high degree of probability in the wet fixed or permanent preparation by anyone capable of reliable clinical work. In *fresh material, it cannot be made at all except* by those with long and special training and thoroughly familiar with the elements of microscopy. Yet, in more than one medical center, untrained technicians are finding histolytica in a high percentage of fresh stool examinations and clinicians are attributing a vast variety of infirmities from Hodgkin's disease to chronic arthritis to infestation with this parasite.

Dobell says (concerning fresh preparations):

> The errors committed by an examiner with little or no previous experience are such as I could not have believed possible if I had not actually encountered them.

In this statement, Dobell is not referring to workers without any training at all, but is writing of his experience in teaching the identification of the ameba of man to a selected group of 37 workers accustomed to the use of the microscope and with previous laboratory training. At the end of 5 weeks, there were 5 of these workers classified as having attained considerable proficiency.

The necessity of good optical equipment cannot be stressed too strongly. Microscopes and lighting such as are frequently found in laboratories result in confusion and error in diagnosis.

To be proficient in the recognition of intestinal parasites, one needs famili-

arity with type forms which are used as patterns and the advantage of having spent much time in reading routine slides under proper guidance. The recognition of type forms however, is a simple matter as compared to the recognition of degenerate or atypical organisms, cellular débris, etc., or coprozoic forms. One needs to know what is not, as well as what is *E. histolytica*.

The temptation to fit a name to everything one sees is very strong, but no matter how fresh the specimens or how experienced the worker, there are always organisms which for one reason or another are impossible to identify definitely. It is better to say "I don't know," than to hazard a guess and be wrong. A second or third specimen might clear up the doubt, or one may have to wait until the series is complete before it is possible to identify the organism certainly. It may even be necessary to have a second series before deciding.

It is generally recognized that a negative result on the first specimen is not conclusive evidence of absence of infection, since these organisms appear in the stools in irregular cycles. The number of specimens to be examined varies with different workers; but many of them have more or less agreed upon 6 consecutive daily specimens as a reasonable number. However, according to our statistics and those of Wenrich, who recently published a survey on 1,000 freshmen at the University of Pennsylvania, 10 daily specimens would be a more conclusive number.

The selection of a method of examination for intestinal parasites has been and still is a much debated question. The various workers in the field have each put forward arguments for a particular method, but it finally simmers down to the fact that there are two methods generally accepted as more or less standard: (a) examination of the fresh material with saline and iodine stain, and (b) the wet-fixed iron hematoxylin-stained method. In the comparison of the reliability of the fresh-iodine-eosin method and the wet-fixed-hematoxylin-stained preparation, there have been some interesting figures given by several workers.

James estimates his percentage of error with fresh preparations as 25; Wenrich, Arnett, and Stabbler as 17. Inasmuch as these men have had great experience in both methods, it would seem that their figures are highly significant. Since the identification of the various intestinal protozoa depends upon the recognition of the different cytological structures, the method of choice should be that one which most clearly presents the structures.

There is no better general cytological stain than Heidenhain's iron-hematoxylin. The greatest argument against it has been the time consumed in preparation. This has been considerably reduced by use of the hot method. In emergencies, a slide for examination can be prepared and read in 2 hours. The dangers of a fresh examination are mainly these: First, in the saline preparation one must contend with both temperature and pH changes. The identification of *E. histolytica* and *E. coli* for years depended on their characteristic movement and pseudopod formation. One forms explosive hyaline pseudopods, the other sluggish and granular. It is now known that it is possible to change the appearance of the pseudopods from hyaline to granular or *vice versa* by altering the pH of the medium. Changes in temperature materially affect the movement. Second, the ingestion of red blood cells is not always a safe criterion for identifying *E. histolytica* inasmuch as *E. coli* may also show this phenomenon.

The finding and identification of cysts in iodine-eosin preparations is

likely to fail because the reaction of the glycogen vacuole and penetration of the iodine into the nuclei is variable. For instance, the staining of the glycogen vacuole in Iodameba has always been given as an unfailing rule for the identification of this form, but we now find that the glycogen vacuole does not always pick up the iodine. The penetration of the iodine into the vacuoles of *E. histolytica* and *E. coli* is sometimes very confusing in this respect. Again, iodine-eosin fails by reason of the fact that identification by counting nuclei is unsafe, as often the per cent of 4 nucleate coli outnumbers the 8 nucleate forms in a specimen, and very occasionally one may find an 8 nucleate histolytica, large race. Another cause for failure of iodine-eosin is that the differentiation of *E. histolytica*, small race, from *E. nana* is practically impossible and when it is there in small numbers, it is easily overlooked.

The amount of material searched on one fixed-stained preparation is about 4 times as much as one sees on one wet mount, and the advantage of being able to pin the object down and take a good look at it not once but several times, more than offsets the time saved in a quickly prepared iodine-eosin preparation.

The need for absolutely fresh specimens in order that the diagnosis may be based on the finding of motile forms is not so acute as generally supposed. While the use of stale specimens is not to be recommended, distance from the laboratory is not an insuperable barrier to good work. Specimens reach us from distances of 300 to 400 miles and the finding of motile amebae in unformed stools 36 to 72 hours old is not uncommon using wet-fixed-stained preparations.

The use of cathartics enhances the chances of finding motile forms but they must be used with caution. Epsom salts has as violent an effect on those organisms as on the endothelium of the intestinal tract and should be avoided. If one must be used, a milder laxative should be chosen, such as effervescent sodium phosphate, bile salts or milk of magnesia. Specimens taken after barium are of no value.

The best results in feces examinations are obtained when the direction of the work is in the hands of one whose interests are not exclusively in the field of protozoölogy or of bacteriology, but who is familiar with both; particularly is this necessary in epidemiological investigations. The laboratory must be of real aid to the physician or health officer requesting the investigations. To do this effectively, it must have full information concerning the patient, or, in the case of epidemiological investigations, the circumstances calling for the investigation. It must be fully informed as to the clinical and epidemiological aspects of both amebic and bacillary infections and the influence of one upon the other. For instance, a bacillary infection or even a gastrointestinal attack from the ingestion of raw sewage without the occurrence of specific, recognizable infection is capable of stirring up a latent amebic infestation and giving the apparent picture of active amebiasis.

The widespread existence of cyst carriers and the common occurrence of intestinal disturbances due to a rapidly increasing list of bacterial causes accentuates the need for close coöperation between the laboratory and the field to the end that a more intelligent study in all situations may be realized. Appreciation of the pitfalls in diagnosis and in epidemiological investigations is not sufficiently common among those causing examinations to be made, to relieve the laboratory director of a very definite obligation as a competent adviser.

The Supervising Nurse*

J. ROSSLYN EARP, DR.P.H., F.A.P.H.A.
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UNTIL a year ago I had supposed that there was no argument as to the value of the supervising nurse. In New Mexico she had been the chief inspiration and motive force of a successful campaign to introduce public health nurses to the state. It was something of a shock to discover at a meeting in Washington a group of state health officers who believe emphatically that there is no place for supervising nurses in a state administration.

The essential argument of the opposition, if I properly understood the opposition, is that the appointment of a supervisor duplicates authority. It is said to require of the nurse that she serve two masters with the inevitable result that either she will hate the one and love the other or else she will hold to one and despise the other. She cannot serve the health officer and the supervising nurse.

No doubt it reflects great credit upon the tact of New Mexico's supervising nurses that I had worked for 5 years with them without ever becoming conscious of the possibility that our nurses might be placed in this embarrassing position. But since the possibility has been drawn to my attention, and since moreover supervision in this state has been extended to include regional supervisors, I have begun to see whence the fear of divided authority may arise.

Let me say at once that if I believed that the position of supervising nurse really did infringe upon the authority of the public health administrator I should go over bag and baggage into the ranks of the opposition. However, I have discussed this matter with several leaders of the profession of public health nursing and I have never found one of them who did not promptly and whole-heartedly agree that the health officer is under all circumstances the sole administrative authority. That is the first principle which I ask all of you to accept.

When that is accepted I believe I hear some voices in the opposition saying: igitur, there is no excuse left for the position of supervising nurse. This brings me to the second principle which I wish all of you to accept, namely, that there is a definite, distinct, and honorable profession of public health nursing.

A great many men who have been trained in the profession of medicine have received with their training a conviction that the nurse is no more than the hand-maid of the physician. She performs no duties which he does not dictate, she knows no secrets of technic which he is unable to teach her. Gentlemen, there were medical officers in the Crimea before Florence Nightingale left England. I am disposed to believe that we were trained to underestimate the professional independence of nurses in our young days. Whether that be so or not I am quite sure that public health nursing is a profession *sui generis*. Our leading universities give postgraduate courses

* Read before the District Health Officers in New Mexico, at Santa Fe, on January 21, 1937.

and issue certificates in this specialized field. I have never taken such a course. I hold no such certificate. I do not believe that I am admitting incompetence when I express my willingness to accept advice from—even to seek the counsel of—the public health nurse.

This does not mean that the public health nurse invades the field of administration, any more than the sanitary engineer invades the field of administration when he advises me that chlorination alone will be adequate for this city's water supply but that yonder city should install a rapid sand filter.

I do not deny that in actual fact the public health nurse may have trespassed. Two imperfections in our own field of administration have served to lure her into the assumption of functions which do not belong to her. These are (1) the part-time health officer, and (2) disagreement among ourselves on what are acceptable administrative policies.

Many public health nurses have hitherto been obliged to carry on their work in counties that either had no health officer * at all or that were under the direction of a part-time health officer with no special training in public health work. Under these circumstances she was compelled to assume much administrative responsibility. Often the only guidance she could get in administrative matters came to her from the state health department through the supervising nurse. As public health is now organized in New Mexico such trespass is quite unwarranted but old habits cannot be broken in a day.

While it is easy to say that the supervising nurse limits her instruction to professional technic and follows in every detail the administrative policy of the health officer, yet in practice the supervising nurse who cannot know by heart all the details of the health officer's policy may unintentionally violate those policies in giving what she believes to be purely professional instruction. Thus she may instruct the nurse in the technic of venepuncture. The nurse may reason that she would not receive this instruction unless she were intended to use it; and therefore she will proceed to take samples of blood from pregnant women who are unable to consult a doctor. But suppose it is contrary to the health officer's policy for any public health nurse to draw blood from a vein?

Or again the supervisor may describe a method for interesting lay groups in the nurse's program. This is her proper function unless it happens that lay advisory committees are anathema to the administrative authority.

It is just this type of administrative interference which in my own experience has caused most misunderstanding. It can be avoided by good will and the full sharing of policies by the health officer with the supervising nurse; or, as I have suggested above, by the health officers agreeing upon standard policies which each of them will accept. There is such a thing as premature standardization and also such a thing as excessive individualism.

The supervising nurse has an accepted place in the organization both of the U. S. Public Health Service and of the Children's Bureau. Her services were recommended as essential to New Mexico by Dr. Carl Buck, Field Director of the American Public Health Association. It ought to be possible for her to assist rather than to interfere with the administrator. That is the function which the official health agencies have designed for her and the function which I am convinced she most earnestly desires to perform.

* New Mexico has had health officers either full-time or part-time in every county since 1919 but many of our public health nurses gained their experience in other states.

Epidemic Bacillary Dysentery in a Hospital for the Insane

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EPIDEMICS of bacillary dysentery in jails, asylums, and similar institutions are always to be dreaded. This is particularly true of hospitals for the insane because of the difficulty in early recognition in psychotic persons, in maintaining suitable isolation, and in enforcing measures which will prevent the spread of the disease.

Two small outbreaks of bacillary dysentery occurred within approximately 1 month of each other in a hospital for the insane. The general sanitation of the institution was of high order and especially was this true of the kitchen.

OUTBREAK AMONG THE FEMALE PATIENTS

On September 9, 1936, an old negro woman, who was not only psychotic but whose speech was limited to a broken French patois, became ill. Her age was 101. She told the physician, "Je suis malade," but no definite information was obtained until diarrhea was discovered by the maids. She appeared somewhat prostrated, temperature 100.8° by rectum, pulse 88, respiration 24. The oral mucous membranes were dry, the tongue coated, the chest clear; no abdominal tenderness, but some gurgling on pressure over the cecum; appetite impaired. As inmates of this type frequently have diarrhea of 2 or 3 days' duration, usually ascribed to their faulty habits of eating, no particular attention was paid to her condition though she was given bismuth by mouth. Examination of the stools was unsatisfactory because of the bismuth in the feces. The nature of her attack was not appreciated until some days later, when purulent exudate was found although cultures were negative.

September 14, 3 other women were reported to have diarrhea. The stools showed the microscopic picture of bacillary dysentery: pus, macrophages and red blood corpuscles. Enteric precautions were instituted and a light, high digestive diet was prescribed. The first cultures were negative, but there was a considerable interval between passage of the stools and making the cultures.

September 17, 2 additional cases occurred. The feces showed the characteristic picture of bacillary dysentery and cultures were positive for *Shigella paradysenteriae* (Flexner) type "X." The kitchen and the personnel were carefully investigated but the fact that no cases had occurred on the male side of the hospital suggested a carrier among the female patients or attendants. No new cases developed until September 22, when 1 occurred, 1 on the 24th, 1 on the 27th, and the last on the 28th. The case on the 24th was in the secluded section, separated from

the rest of the women. On the 28th one of the so-called well patients was discovered in the isolation room of a dysentery patient, supporting her and holding a sputum cup. She had eluded the maid. She had been accustomed to assist in carrying trays at meal time and was very solicitous in giving attention to other patients, such as combing their hair, assisting them to the toilet, etc. Her stools showed exudate and were positive for *S. dysenteriae* type "X." It was found that 2 or 3 times a month this patient had refused to work and stayed in bed. Although she was having several liquid bloody stools per day, she was up, active and complaining bitterly because she was isolated. No new cases developed following her isolation. Only 1 patient died, of bronchopneumonia on the 56th day after the onset of her dysentery. At autopsy no lesions were found in the intestines.

The only association between the male and female sides occurs when doctors or nurses visit the wards. The kitchen serves both sides, but following the recognition of dysentery all utensils used for food to the affected patients were sterilized before being brought back to the kitchen.

OUTBREAK AMONG THE MALE PATIENTS

October 14, 1936, diarrhea developed on the male side of the hospital, in a decrepit man with advanced central nervous system lues. He had been subject to gastrointestinal upsets with diarrhea or constipation, but because the staff was on the lookout for diarrheal disease, he was immediately isolated. On October 18, diarrhea developed in another patient, but neither showed exudate in the stools and cultures were negative. October 21, another case of bacillary dysentery occurred. Other cases developed as follows: October 25, 1; October 29, 1; November 1, 2; and 1 each on November 3, 8 and 10. Characteristic exudate was present in the stools, and cultures gave *S. paradysenteriae* type "W." Thus the cultures showed that the source of the epidemic on the male side was different from that in the female wards. In an effort to locate the source, the feces of all patients admitted to the male side within 3 months prior to October 21 were cultured. Rectal swabs were utilized and culture plates inoculated directly. One carrier of *S. paradysenteriae* type "W" was found, a patient with advanced psychosis with syphilitic meningo-encephalitis. He was deteriorated, confused, filthy in his habits, and wandered around the ward sufficiently to scatter feces about with unusual efficiency. He had never made a complaint of any kind. He was isolated November 9, one day before the last case of this outbreak occurred. One patient 81 years of age, with advanced cerebral arteriosclerosis, died a week after onset. Autopsy revealed some superficial ulceration of the cecum, sigmoid and rectum which was not considered sufficiently severe to have been more than an additional factor.

These 2 outbreaks are reported because they demonstrate the aid which the differentiation of the antigenic type of *S. paradysenteriae* gave by determining that the outbreaks had different sources although they both occurred within 60 days in an institutional population fed from one kitchen. The rôle played by carriers in these epidemics again emphasizes the outstanding importance of this aspect of the epidemiology of bacillary dysentery.

SUMMARY

Two small epidemics of bacillary dysentery in a mental hospital are reported.

Each epidemic was caused by an apparently healthy carrier; isolation of the carrier controlled the outbreak.

Laboratory evidence established the cause, the carrier, and proved the outbreaks had no relation one to the other.

NOTE: The authors express their appreciation to Lt. Col. J. B. Anderson, M. C., Superintendent of Corozal Hospital, Canal Zone, for permission to report these outbreaks, and to Lt. Col. G. R. Callender, M. C., President, Army Medical Research Board, Ancon, Canal Zone, for assistance in the study and in the preparation of this report.

Opium and Other Dangerous Drugs

"The problem of narcotics first came before the Health Committee in 1931 when it was called upon to determine the legitimate requirements of those drugs in various countries. Having laid down the principle that the only legitimate requirements were those in respect of medical and scientific use, the committee, in the light of detailed investigations, fixed the maximum at 450 milligrams of opium and 7 milligrams of cocaine per head of population per year (1924) and this only for those countries with advanced medical organisations. These two figures have since been generally accepted, in particular at the International Opium Conference in 1925 as standards of legitimate consumption.

"An analogous enquiry was undertaken in 1929 in order to determine the world requirements in narcotics with a view to facilitating the work of the Conference on Limitation, planned for 1931. These figures were fixed at 9,700 kilogrammes for morphine, 790 kilogrammes for diacetylmorphine and 6,000 kilogrammes for cocaine, and have successfully withstood the test of time.[1]

After the ratification of the International Opium Convention of 1925, fresh responsibilities of permanent character fell to the Health Committee. Under Article 8 of that convention the committee has since examined the proposals of 18 governments [2] in regard to 290 preparations, 51 of which were considered to be innocuous and were excluded from the scope of the Convention."—Twenty-fifth Session of the Health Committee, League of Nations, May 4, 1937.

1. According to the Permanent Central Opium Board, 9,413 ks. of morphine, 674 ks. of diacetylmorphine and 4,002 ks. of cocaine were manufactured in 1935 (Document C. 368. M. 242).

2. Argentine, Austria, Bulgaria, Estonia, France, Germany, Hungary, India, Lithuania, Netherlands, Poland, Rumania, Siam, Sudan, Switzerland, Union of South Africa, United Kingdom.

Escherichia-Aerobacter Intermediates from Human Feces

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THE phrase, *"Escherichia-Aerobacter* intermediates," has been variously employed in the literature of the past decade. At present it customarily refers to coliform bacteria which differ from typical Escherichia or Aerobacter strains in one or more of the major differential reactions, such as the Voges-Proskauer, methyl-red and citrate utilization tests. Recent discussion has tended to confine the designation to those organisms which are Voges-Proskauer-negative, methyl-red-positive, and capable of multiplying in a medium containing citrate as the sole source of carbon.

Apparently the intermediates are found as ubiquitously as are any of the other coliform bacteria. The first reports of such intermediate bacteria were made by Koser [12-16] who isolated a number of strains from soil, water, and human and animal feces. Lewis and Pittman [21] also obtained intermediates from water, either polluted or unpolluted. Intermediates have been found in feces by Kline,[10] Skinner and Brudnoy,[32] Parr,[22] Shunk,[30] and Tittsler and Sandholzer.[33] The latter authors also studied strains isolated from urine, water and soil. Kline,[10] Kon,[11] and Yale [37] obtained citrate-positive, methyl-red-positive, Voges-Proskauer-negative coliform bacteria from milk and other dairy products. Levine, *et al.*[20] found similar organisms in eggs. Hajna and Perry [9] obtained intermediate strains from the intestinal contents of various cold-blooded animals, and Griffiths and Fuller [8] likewise found intermediates in commercial fish and fillets.

Intermediates have also been reported in water by Ruchhoft, *et al.*,[27] Gray,[7] Poe,[24, 25] France,[6] and Parr and Caldwell.[23] The latter authors found that 8.4 per cent of 1,407 samples of well water contained intermediate coliform bacteria. They stated that in no case where intermediates occurred could the possibility of fecal pollution be excluded. A question which naturally arises concerns the frequency with which intermediates occur in human feces. The present investigation was undertaken as an attempt to provide data upon this point.

EXPERIMENTAL

A. *Isolation of Strains*

Four hundred and sixty-six samples of human feces were plated on eosin-methylene-blue agar after a preliminary 8 hour enrichment in lactose broth. One or more colonies of both Escherichia and Aerobacter types (Levine [19]) were picked and tested for utilization of citrate, and for their reactions in the Voges-Proskauer and methyl-red tests. The latter tests were performed on cultures in Clark and Lubs's [5] synthetic medium which had been incubated for 2 days at 37° C. Voges-Proskauer

tests were made by use of creatin and Leifson's [18] reagent. The Voges-Proskauer and methyl-red tests were later repeated on glucose-phosphate-peptone cultures after 3 days of incubation at 30° C. In this case acetyl methyl carbinol was detected by the Barritt [2] modification of the Voges-Proskauer test, for which a much greater delicacy is claimed. Citrate utilization was determined by growth and formation of alkali on Simmons's [31] citrate agar, and later checked in Koser's [12] synthetic liquid medium, with incubation at 30° C. and 37° C. The reactions of strains reported in this study did not change on replating or on aging.

The distribution of coliform bacteria in the 466 samples of human feces is shown in Table I. Samples are grouped in the table according to the types of coliform bacteria occurring in them. This table cannot be considered an exact index of the occurrence of coliform bacteria in all human feces, due to the fact that not all colonies on each plate were tested: the average number of colonies picked was 5. Therefore it is possible that Escherichia was simply overlooked in the 45 samples in which this type was apparently absent. The failure of growth of coliform bacteria on plates from the 12 samples in Group 8 may have been due to overgrowth by fluorescent bacteria.

It is of interest to note the relatively widespread occurrence of citrate-positive organisms in human feces: in the present investigation 49.8 per cent of the samples contained such strains. This figure is somewhat higher than those reported by many previous workers (see Ruchhoft, *et al.*[27]) and confirms the fallacy of employing the citrate utilization test as an indication of the non-fecal origin of bacteria in water. Furthermore, the presence of intermediate strains in 13.3 per cent of the samples demonstrates that this group may be of sanitary significance.

Table I also shows that from only 1 sample was an intermediate strain isolated in the apparent absence of other coliform bacteria. In this particular case, only 2 colonies were picked, the other later failing to ferment lactose. It may therefore be said that almost without exception the intermediate coliform bacteria are accompanied in human feces by either Escherichia or Aerobacter strains or both, as in Groups 3, 5, and 6. Furthermore, the data show that less than half (47.6 per cent) of the samples studied contained only Escherichia strains.

In several instances analysis of suc-

TABLE I

Occurrence of Coliform Bacteria in Human Feces

	Escherichia	*Aerobacter*	*Intermediate*	*Number of Samples*	*Per cent of Total*
Citrate	—	+	+		
M. R.	+	—	+		
V. P.	—	+	—		
Group					
1	Present	Absent	Absent	222	47.6
2	Present	Present	Absent	152	32.6
3	Present	Present	Present	31	6.7
4	Absent	Present	Absent	18	3.9
5	Present	Absent	Present	16	3.4
6	Absent	Present	Present	14	3.0
7	Absent	Absent	Present	1	0.2
8	Absent	Absent	Absent	12	2.6
Samples containing	421	215	62	466	100.0
Per cent of Total Samples	90.3	46.1	13.3		

cessive samples from one individual indicated that intermediates were always present. In 1 case this has been true for 2 years.

B. *Characterization of Strains*

One hundred and seventeen strains of intermediates, together with 8 strains obtained through the courtesy of Dr. Werkman of Iowa State College and Dr. Tittsler of the University of Rochester, were further studied in an attempt at classification. These were tested repeatedly over a period of 8 months in litmus milk and in various carbohydrate media; hydrogen sulphide production was determined in lead acetate agar and in peptone iron agar, and motility was tested in 18 hour nutrient broth cultures, and in semisolid agar. All cultures were incubated at 37° C. Carbohydrate media were prepared by addition of 0.5 per cent or 1.0 per cent of the carbohydrate to ordinary nutrient broth; the reaction was adjusted to pH 7.0. Carbohydrate cultures were observed for production of acid and gas daily for 2 weeks. Litmus milk cultures were observed daily for 10 days, and lead acetate or peptone iron agar cultures daily for 1 week.

In addition, nutrient gelatin cultures were incubated at room temperature for 30 days and observed periodically for liquefaction by placing in the refrigerator at 5° C. for 2 hours. Indol production in 1 per cent Bacto tryptone cultures was determined after 24 and 48 hours of incubation at 37° C. by use of Kovács's [17] reagent. Reduction of nitrate in a 0.1 per cent KNO_3 nutrient broth medium was determined after 24 hours of incubation at 37° C. with sulfanilic acid and dimethyl-alpha-naphthylamine. Morphology, Gram reaction, and spore formation were studied in 18 to 24 hour nutrient broth cultures.

The characteristics common to all the intermediate strains are as follows:

Gram stain	Negative
Morphology	Rods
Spore formation	Negative
Motility	Positive (4 exceptions)
Citrate utilization	Positive
Methyl-red test	Positive
Voges-Proskauer test	Negative
Gelatin liquefaction	Negative
Indol production	Negative
Nitrate reduction	Positive
Arabinose fermentation	Acid and gas
Cellobiose fermentation	Acid or acid and gas (1 exception)
Galactose fermentation	Acid and gas
Glucose fermentation	Acid and gas
Lactose fermentation	Acid and gas

It is of interest to note that all but 1 of the 125 strains fermented cellobiose with the formation of acid or acid and gas. Tittsler and Sandholzer [34] have recently reported fermentation of this carbohydrate by 38, or 84.4 per cent, of 45 citrate-positive, methyl-red-positive, Voges-Proskauer-negative strains of coliform bacteria.

The heterogeneity of the intermediate strains is shown by Table II. On the basis of 6 reactions, the 125 strains formed 28 groups of 1 to 32 strains each. In the present experiments fermentation of raffinose paralleled closely that of sucrose. Winslow and Walker [36] observed a similar correlation in studying differential tests for the colon group of bacteria.

DISCUSSION

The problem of allocating such strains as these in a system of bacteriological classification is difficult. Bergey [3] distinguished between the Escherichia and Aerobacter genera on the basis of acetyl methyl carbinol production from glucose. However, for the past few years it has been common practice to include the methyl-red test and utilization of the citrate radical as criteria of the genus to which a given coliform bacterium belongs. Braak [4] described several strains of an organism designated *Bacterium freundii*, which

TABLE II

Heterogeneity of Intermediates from Human Feces

Group	Milk*	H_2S	Sucrose†	Salicin†	Dulcitol†	α-Me-Gluc.†	No. of Strains
1	+	+	+	+	+	+	4
2	+	+	+	+	+	—	1
3	+	+	+	+	—	+	1
4	+	+	+	+	—	—	4
5	+	+	+	—	—	—	8
6	+	+	—	+	+	+	8
7	+	+	—	+	+	—	1
8	+	+	—	+	—	+	1
9	+	+	—	+	—	—	1
10	+	—	+	+	+	+	17
11	+	—	+	+	—	+	1
12	+	—	+	+	—	—	5
13	+	—	+	—	—	—	2
14	+	—	—	+	+	+	9
15	+	—	—	+	—	+	2
16	+	—	—	+	—	—	1
17	—	+	+	+	+	+	2
18	—	+	+	+	—	—	10
19	—	+	+	—	+	+	1
20	—	+	+	—	—	+	1
21	—	+	+	—	—	—	7
22	—	+	—	+	+	+	32
23	—	+	—	+	—	+	1
24	—	+	—	+	—	—	1
25	—	—	+	+	—	+	1
26	—	—	+	+	—	—	1
27	—	—	+	—	+	+	1
28	—	—	—	+	+	+	1
							125

* A (+) sign indicates acid coagulation, (—) indicates acid reaction.
† A (+) sign indicates acid or acid and gas, (—) indicates no change.

occupied an intermediate position when classified by these tests, but made no further attempt to classify them. Werkman and Gillen [35] proposed adoption of the genus name Citrobacter, designated primarily to include those organisms which produce trimethylene glycol from glycerol under anaerobic conditions. Secondarily it was stated that all strains studied were citrate and methyl-red-positive and Voges-Proskauer-negative, or only weakly positive.

This suggestion was immediately attacked by Skinner and Brudnoy,[32] who studied 63 intermediate strains isolated from human feces, on the ground that recognition of the genus would pave the way for proposal of innumerable other genera characterized by only minor differences from the established genera of coliform bacteria. It was later stated by Tittsler and Sandholzer [33] that

> . . . the heterogeneity of the *Escherichia-Aerobacter* "intermediates" renders it extremely difficult, if not impossible, to establish a new genus which will separate them from both the Escherichia and Aerobacter genera and yet in itself be sufficiently inclusive.

The above statements are emphasized by the data shown in Table II. Werkman and Gillen, studying 15 strains of trimethylene glycol-producing organisms, described 7 species to be included in the genus Citrobacter. Only 5 of our 125 strains (groups 3 and 4 in Table I) correspond to any of the species suggested by Werkman and

Gillen. These strains resemble *Citrobacter freundii* (fermentation of alpha-methyl glucoside was not reported in the original characterization).

It is therefore evident that a complete classification of the intermediate strains would involve acceptance of very many new species, as well as new genera based on different combinations of the citrate, methyl-red and Voges-Proskauer reactions. At present, however, the major problem appears to be that of proper generic allocation of the intermediates. As mentioned previously, the proposed genus Citrobacter was defined primarily on the basis of trimethylene glycol production from glycerol under anaerobic conditions. The procedure involved in this test is laborious and time consuming, and outside the scope of the ordinary bacteriological laboratory. Furthermore, it is a question whether one such feature is sufficient to justify establishment of a new genus, since to be of practical use a genus should be defined by easily applied tests which represent distinctive physiological characteristics. The genus Citrobacter could therefore be redefined to include all Gram-negative, aerobic, non-sporeforming bacteria which produce acid and gas from dextrose and lactose, and are methyl-red-positive, Voges-Proskauer-negative, and utilize citrate as a source of carbon.

The alternative solution is to include the intermediates in already existing genera. This suggestion is supported by several considerations. In the first place, the genera Escherichia and Aerobacter are distinguished by fundamental differences in their physiology, as shown by the schemes for fermentation of glucose devised by Scheffer,[20] Reynolds,[26] and others. Simple tests (methyl-red and Voges-Proskauer) are available by which these differences can be demonstrated. It has not yet been shown that a fundamental difference exists between the citrate positive and negative Escherichia strains. Production of trimethylene glycol may or may not be evidence of such a difference. However, Schaeffer[28] has shown that 12.9 per cent of 70 citrate-positive, methyl-red-positive, Voges-Proskauer-negative intermediate strains failed to ferment glycerol in a peptone-water medium, so it appears possible that strains may be found which do not produce trimethylene glycol from glycerol. Utilization of citrate may be a fundamental physiological characteristic, but this has not yet been shown. Its correlation with production of acetyl methyl carbinol in the Aerobacter genus may be purely fortuitous.

The intermediates considered in this paper could be classified as Escherichia strains which possess the ability to utilize citrate as a source of carbon. However, there exist strains of intermediate coliform bacteria which are not included in this group. Ruchhoft, *et al.*,[27] Bardsley,[1] and Barritt[2] have described intermediates which utilize citrate, and are methyl-red- and Voges-Proskauer-positive. The first named authors have also described organisms which are citrate positive but methyl-red- and Voges-Proskauer-negative. Therefore it seems logical to include all intermediate coliform strains in the genera Escherichia or Aerobacter as at present defined, at least until such time as they have been shown to possess distinct physiological differences which justify establishment of new genera. Intermediates could then be distinguished from the recognized members of these genera by sub-dividing on the basis of citrate utilization and the methyl-red test.

CONCLUSIONS AND SUMMARY

1. Citrate utilizing coliform bacteria have been found in 49.8 per cent of 466 samples of human feces. Thirteen and three-tenths per cent of the samples contained organisms of the citrate-positive, methyl-red-positive, Voges-Proskauer-negative intermediate group,

thereby demonstrating that the latter are of sanitary significance. Such intermediates do not usually comprise the sole coliform bacterial flora of the human intestine, although they may be found characteristically present in certain individuals.

2. The cultural and physiological characteristics of 125 intermediate strains showed a heterogeneity which rendered impossible any attempt to classify them according to present schemes.

3. It is suggested that the coliform bacteria be classified primarily on the basis of acetyl methyl carbinol production from glucose, and secondarily on utilization of citrate as a sole source of carbon and on the methyl-red reaction. Intermediate strains would then be allocated to the genera Escherichia or Aerobacter, and distinguished from organisms at present included in these genera by their citrate and methyl-red reactions.

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CURATIVE AND PREVENTIVE MEDICINE

THAT there are fashions in medicine goes perhaps without saying, some due to new discoveries and general advances in our knowledge, some to fads introduced by some "bright light," and followed by those who do not know enough to detect a fallacy, or are not willing to think for themselves.* In preventive medicine the same thing holds true, though here the influences of great foundations and of governmental agencies are often directing forces. However, in this branch of medicine most of the newer lines of work are based on extensive studies, national and even international, and are, to that extent, reasonable. A short time ago we pointed out that in England, housing, with its concomitant abolition of slums and overcrowding, and the question of nutrition, were much to the fore. These two conditions have been the subject of studies in many parts of the world and one can hardly doubt that they are among the most important lines of endeavor. To these may be added a subject which has been much considered in this country as well as others—physical education—and another which is much written about but which has fared badly, practically—maternal mortality.

Three of these public health matters are distinctly preventive in their effect, and have for their object the bettering of health for those now living, but particularly for those in the next generations. That they will have some effect on the general death rate may be taken for granted, but as far as we know, they will not affect the death rate from the diseases which cause the greatest number of deaths in adults; diseases of the heart and arteries, in which syphilis plays a very large part; cancer, which apparently is on the increase; and pneumonia, one type of which often strikes the robust, and another which so frequently follows diseases

* Just now dish washing and cleanliness of eating utensils are attracting much attention in this country.

like influenza, which is now endemic with exacerbations practically every year. One might reasonably expect that there would be a favorable influence on the death rate from tuberculosis, but, as has been pointed out by many, and especially by Dr. E. Burnet,[1] the death rate from tuberculosis has been falling for a number of years, apparently without regard to the measures being taken in every country for its prevention. It was held that these preventive measures are most successful where the death rate has begun to fall apparently of its own accord. Some authorities believe that the wave of epidemic tuberculosis has spent itself and the disease has now reached its endemic level, at which it will remain in spite of efforts against it. This of course is largely theory, but must be considered. If we measure our success by the death rate, we must remember that in proportion as we increase the average age of the population, so does the death rate from certain diseases increase. The lessening of the death rate in childhood, for example, brings more people to the age when cancer becomes a menace.

Much has been written on the part the general practitioner plays in prevention. Before the days of bacteriology we did not know much about prevention and did not try to practise it to any great extent. Now every conscientious practitioner is also practising preventive medicine. What other instance is there of a profession, great or small, in which the members are constantly engaged in putting themselves out of business? Vaccination against smallpox and typhoid fever, for example, may be mentioned, but there are few branches of medical science in which there is now more activity than in the attempted prevention of all contagious diseases by vaccines or chemical substances like quinine, salvarsan and its congeners, and that most remarkable and most recent discovery, protonsil. Prevention by other means has reached its limit; vaccines seem to be the only hope. Take the acute respiratory infections which are our greatest stumbling block. Will we ever be able to quarantine for the ordinary acute cold or mild bronchitis? What protection is there in schools against these common infections except vaccination? How much would quarantine and isolation cost, and how long will it be before the public will stand for such measures, yet as far as loss of time and inconvenience goes, acute coryzas stand well at the top of all diseases.

It must be perfectly clear to every thoughtful person that curative medicine and preventive medicine cannot exist one without the other. There should be no jealousy between the two, yet we know that there is a very strong feeling on the part of many practitioners against certain types of preventive medicine, some of which has been engendered by the ill considered demonstrations by great lay foundations or unwise programs on the part of health departments.

To those of us particularly interested in the preventive side of medicine, it is extremely gratifying to see how our branch has come into its own. As said recently concerning preventive medicine:

> . . . although much the younger, has the greater achievements to its credit, for it has abolished some diseases entirely and greatly diminished the incidence of others; it has enormously reduced the death rate and has added materially to the expectation of life.

Unquestionably a number of other factors have aided in producing these results. Jealousies have been brought about and disappointments created by exaggerated claims for preventive measures, and the disillusionment which has come from partial or complete failure of some of these loudly proclaimed salvations has injured the general cause.

A word about curative medicine must be said. The campaign for early diagnosis as a preventive measure is applicable only to chronic diseases like tuberculosis and cancer. We must remember that practically all of the infections which gain entrance through the upper respiratory tract are most contagious during the first few days when, according to our present practices, the sick person is often not under the care of a physician, and is never isolated or hospitalized. Some 30 years ago there appeared in England a book which presented this side of the question in an unusually striking fashion. The facts are incontrovertible, yet our methods remain much the same. We lock the stable after the horse has escaped. Treatment has shown great advances and the sick person is in many cases no longer the dangerous focus of infection that he was formerly. Unfortunately from this standpoint, some of our most remarkable successes have been in noncontagious diseases (as far as we now know), like diabetes, pernicious anemia, etc.

The thoughts and facts presented here are not new, though we venture to say that they are too little realized and acted upon. They have recently been collected and brought to our attention in an unusually thoughtful address.[2] We can do no better than to close with the words of the lecturer:

> It is surely better to face the facts without illusions, for "things are what they are and their consequences will be what they will be. Why, then, should we seek to be deceived?"

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2. Hutchison, Robert, M.D. The Progress and Present Aspect of Medical *Science*. The Dr. Isaac Gilchrist Lecture, Delivered before the University of Aberdeen, Nov. 12, 1936. *Brit. M. J.*, Jan. 9, 1937, pp. 57–61.

LEST WE FORGET

IF we should say that Americans were too modest there would doubtless be many to dispute it. From foreign lands there would almost certainly be a chorus of protest—perhaps a just one. However, there are certain qualities in evidence in our scientific people which might possibly be construed as meaning this quality. It is perfectly certain that we have never given sufficient credit to our own scientific people, especially the pioneers. It is still true, though fortunately not so true as it was, that instead of studying and quoting American literature, practically every writer refers by preference to European articles and European authorities. No doubt there was some reason for this 25 years ago, but now there is no question that in science our workers are the equals of any in the world and our laboratories as good as any.

In regard to public health, we are accustomed to refer to the work of Chadwick and to credit him with being the first to bring about the awakening which has resulted in the enormous amount of fruitful endeavor now so much in evidence. Especial credit is due to him, since at that time the science of bacteriology had hardly been born, and nothing is further from our mind than to detract one iota from the work of great men in foreign countries. We hold, however, that we have neglected our own great men, and we welcome every evidence of awakening recognition of our own people.

We feel that a distinct service has been done by bringing to the attention of the Health Organisation of the League of Nations, and through it to the American public, a remarkable piece of work of which comparatively few are aware; namely, "the first attempt to elaborate a complete system of appraisal of health con-

ditions together with administrative activity," made some 60 years ago by the late Dr. John S. Billings, Surgeon in the United States Army, and founder of the Army Medical Library.[1] Either one of these accomplishments would have been sufficient to make him famous. Dr. Billings says in his covering letter, dated Washington, D. C., August 25, 1875: "These questions are intended to obtain, as far as possible, the information which would be desired in estimating the healthfulness of a given place, and to ascertain the local and especially the preventable causes of disease at that point. Facts and not opinions are desired, and the questions are drawn up in that point of view."

The following chapter headings show the broad conception which Dr. Billings had in that early day:

A. Location, Population and Climate
B. Topography and Geology
C. Water Supply
D. Drainage and Sewerage
E. Streets and Public Grounds
F. Habitations
G. Gas and Lighting
H. Garbage and Excreta
I. Markets
K. Slaughter-houses and Abattoirs
L. Manufactories and Trades
M. Public School Buildings
N. Hospitals and Public Charities

As pointed out, Dr. Billings showed in regard to several matters a wider conception of public health activities than that which has prevailed until recently. The writers say further: "It is truly remarkable that Dr. Billings should have recognised and emphasised sixty years ago the influence upon public health of urbanism, housing and overcrowding, which, in his own country, are not yet viewed as matters of public concern in relation to health. There are questions as to the employment of women and children in factories, and diseases due to working conditions. In the chapter on schools, questions are asked, not merely regarding sanitation of the premises, but in regard to playgrounds, indoor and outdoor physical exercise, and the result of medical examinations and tests of vision."

The average person does not appear to realize what pioneer work involves. The majority of us are more or less like sheep—some leader gives birth to a great idea which strikes a responsive chord, others follow because it becomes popular, others in order to go with the crowd, and a choice few because they realize the fundamental importance of the new concept. Those who lived through this awakening to public health remember how slow the majority were to accept and act upon the facts. In spite of the present tremendous activity, most of our universities and medical schools have not shown the progress in regard to the teaching of preventive medicine and public health one might expect. We believe that one of the most significant as well as hopeful features of the situation lies in the fact that a number of historians are now delving into medical archives to find the explanation of certain trends in our civilization and life.[2,3]

This *Journal* delights in doing honor to the great men of our own country. As a people we believe that we have been too much taken up with practical affairs to render due homage to those who have gone before. We offer what we know to be a deserved tribute to Dr. John S. Billings.

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LETTER FROM GREAT BRITAIN

THE CORONATION AND HEALTH CONFERENCES

Amongst the vast numbers who came from overseas to take part in the celebrations associated with the Coronation of King George VI, there were many connected professionally or otherwise with public health work in various parts of the Empire. The advantage of bringing together these representatives to exchange views and experiences was recognized, and numbers of conferences were arranged. One of the earliest had for its object discussion of the various problems associated with the prevention and control of tuberculosis in various parts of Great and Greater Britain. Chiefly responsible for the Empire Conference on Tuberculosis, as it was described, was Sir Pendrill Varrier-Jones, whose work as Director of the Colony at Papworth and in connection with tuberculosis generally, is so widely known. The various meetings were well, though not largely, attended, and were very interesting because representative of so many of the countries within the British Comity of Nations. The fact that, in addition to the Minister of Health delivering an address of welcome to the delegates, the Government provided an evening reception in their honour, suggested that the conference was regarded as of considerable importance.

TUBERCULOSIS CONFERENCES— IMPERIAL AND OTHER

That Sir Arthur MacNalty, Chief Medical Officer of the Ministry of Health, attended to read a paper on the modern outlook on tuberculosis, and none but members of the peerage, amongst them Lord Horder, Lord Dawson, and Viscount Goschen, presided at the various sessions, heightened this impression. Of the noble lords, most had something to say that gave encouragement even to the workers who mostly need it; those in India, for example, in districts where the tuberculosis problem is of proportions that almost defy all efforts at solution. Lord Horder was one exception, his contribution containing a suggestion that there was no real reason, as some claimed, for believing that we were well on the way to securing control of the disease. Six times as many persons, he said, died of tuberculosis annually as were killed in street accidents, and every 24 hours in England saw 90 perish of consumption. Lord Horder was practically the only speaker to strike a lugubrious note; everybody else putting a bright face upon it, as if to support the frequent assertion that so far as the infected were concerned, the aim should be to ensure happiness and a contented mind. At Papworth, because those who were sent there to settle were given work to do and were paid for their work, happiness and contentment reigned. So, apparently, it does in Canada, if one may judge from what Dr. Wodehouse had to say. Most of the success attending the Canadian efforts, it appeared to me, came because the line followed was that adopted in the United States in relation to tuberculosis. A similar course, I rather gathered, in his view, might be pursued with advantage by us here, our scheme not being much to his liking.

Amongst other speakers from overseas, several proved most impressive, amongst them the representatives of India, Sir Cuthbert Sprawson; of Australia, Dr. Collins; of the Straits Settlements, Dr. MacGregor; of Nigeria,

Dr. Canchi; and of the Transvaal, Dr. Pringle, whose description of the fight against silicosis and tuberculosis and the progress made attracted a vast amount of attention. Conspicuous amongst the British authorities contributing, were Sir Henry Gauvain and Sir Pendrill Varrier-Jones, the latter of whom entertained the delegates at Papworth, and explained the methods adopted at the Village Settlement there.

CONGRESSES ON HEALTH AND MATERNITY AND CHILD WELFARE

Meetings are scheduled for the Health Congress of the Royal Sanitary Institute, and the English-Speaking Conference on Maternity and Child Welfare. Both of these are annual events, and the bodies concerned have made special efforts this year in connection with their arrangement, anticipating the presence of more visitors from overseas than usual. The Royal Sanitary Institute Congress meeting place is Birmingham, one of the most progressive cities in the country in public health and all other directions. The very enthusiastic Medical Officer of Health is Dr. Newsholme, a nephew of Sir Arthur Newsholme, whose name and work are so well known in the United States. In many ways the Health Congress of the Royal Sanitary Institute resembles the Conferences of the American Public Health Association, and I propose to write fully of the proceedings later. In the meantime, I mention that at the various sections, matters both of local and general moment, ranging from care of the preschool child to anti-malarial marsh reclamation and drainage, will be discussed under the presidency of persons of high local, national, or international notability. The Conference on Maternity and Child Welfare takes place in London. Like the Empire Tuberculosis Conference, it receives special recognition at the hands of the Government, its delegates being accorded a reception at a one-time ducal mansion in the very fashionable St. James's quarter of the Metropolis, Lancaster House, more or less reserved for purposes of reception by the Government and ministerial heads of departments. As the conference describes itself as an "English Speaking" one, it is not surprising to find that the hope is nourished that representatives from the United States will attend and take part, the idea which, it is said, will run through the whole conference being "the further evolution of the maternity and child welfare movement throughout the British Empire and in the United States."

MATERNAL MORTALITY IN ENGLAND AND WALES

Though to a great extent accidental, the moment of the holding of this conference is particularly appropriate, coinciding as it does more or less with the issue of the report of the Ministry of Health on maternal mortality. The investigation upon which the report is based, followed and to an extent arose out of those conducted by the special departmental committee set up in 1928 to go into the whole question, and that finally reported in 1932. The present investigators were all medical officers of the Ministry of Health, which is a guarantee that the work was thoroughly done, and that the statements in regard to conclusions and recommendations are reliable. The enquiries were carried out in special areas; those in which the puerperal mortality rate for the decade 1924–1933 was higher than 5 per 1,000, and, for purposes of comparison, certain others in which during the same period the rate was relatively low. Investigating causation, the officers concerned took a wide view and enquired into a large number of factors that might

conceivably or that had been alleged to have an influence—poverty, unemployment, overcrowding, malnutrition, and so on. In almost every case, the evidence was inadequate to permit of the incrimination of any one of the factors. So far as conditions contributing to maintenance of a high rate are concerned, the investigators found themselves compelled to draw particular attention to abortion. The fact of their having done so was taken note of particularly by the press and widely commented upon, as was the determination expressed by the Minister of Health to set up a special committee to enquire into its prevalence, and to see generally what could be done about it.

A COMMITTEE ON ABORTION

The committee set up for this purpose has a most interesting composition, being presided over by a most distinguished lawyer, and including the wife of the Prime Minister (Mrs. Baldwin) and the daughter of Elinor Glyn—(Lady Williams), who are and have been, both of them, greatly interested in all matters connected with maternal welfare. In addition, there are several specialists in obstetrics, a medical officer of health—one only—and a coroner. Amongst the recommendations in the report, the chief have already been made the subject of direction by the Minister to local health authorities. Most of these aim at improving the quality of assistance rendered to women, not only at confinement but ante- and post-natally as well. Very definitely there is a call for the appointment and employment of specialists in obstetrics to act apart from or in consultation with general practitioners and midwives. One thing that has appealed to the public is what is described as the "flying squad," to consist of a specialist or specialists who will form an emergency domiciliary service in cases of grave obstetric abnormality in which removal to hospital is contra-indicated. The reason behind the suggestion to set up these squads was the discovery that in some places the mortality reports contained reference to cases in which death had occurred during transit to hospital of women suffering from eclampsia or hemorrhage or severe shock. Though the report is one having reference entirely to conditions and cases here, it is probable that it contains much that must have interest and value elsewhere. Like the run of Ministry of Health reports, it is interestingly written and very practical.

HONOUR FOR AN HONORARY F.A.P.H.A.

The Society of Medical Officers of Health at the May meeting, proceeded, as usual, to the election of the President for the next session. On this occasion, choice fell upon Dr. James Fenton, Medical Officer of Health of Kensington. Dr. Fenton, it may be remembered, took part in the symposium by British Health Officers at the Annual Conference of the Association at Montreal in 1931, and had then conferred upon him the Honorary Fellowship of the American Public Health Association; an honour, I know well, he prizes very greatly.

CHARLES PORTER, M.D.

31st May, 1937.

PUBLIC HEALTH EDUCATION*

"Immediate objectives of health propaganda in Great Britain were defined in a recent memorandum of the Central Council for Health Education, as follows:

"1. To attract the attention of those not already interested in health and hygiene, and in need of information on the subject."

"2. To impart information of the most up-to-date character in the simplest and soundest form to those whose interest has been aroused."

"3. To inspire action and change of habit on the basis of the information given."

New York in October, 1937—The Public Education Section Council and special committees are busily engaged in preparation for Section participation in the A.P.H.A. Annual Meeting.

A health education headquarters will be maintained. Several committees will have reports.

What have you to offer for display at headquarters?

Broadcasting in Manitoba—Three weekly broadcasts are put on the air by the Bureau of Health Education, Department of Health and Public Welfare. The Bureau is part of the Division of Disease Prevention, Legislative Building, Winnipeg.

"Health Problems of Today" go on the air Tuesday and Friday, 3:45 to 4:00 p. m. via Stations CKY and CKX.

Checking up on the human organism . . . High road to dental health . . . The art of growing old gracefully . . . The hazards of occupations . . . Food poisoning and how to avoid it . . . Why food should be cooked properly . . . What shall we eat: infancy and preschool; school and adolescence; maturity and middle age; old age . . . Can you prove you were born? . . . Can you believe your own eyes? (statistical facts) . . . Child health as reflected in vital statistics . . . Understanding our children (series of 6 talks by the Parent Education Association of Winnipeg) . . . Our social health (series of 4 talks) . . . Helping the hard of hearing (series of 6 talks by the Winnipeg League for the Hard of Hearing) . . . Why clean up? (series of 6 talks) . . . Accident prevention . . . Preventing hay fever . . . Vacation dangers . . . Building health in summer.

A series of dramatized episodes in the life of the Healthwell Family are presented Tuesdays, 7:45 to 8:00 p. m., via Stations CJRC and CJGX, will give

. . . interesting sidelights of daily happenings which relate to personal health and well-being, as well as discussion of various questions which affect health and social relationships.

The "Our Social Health" series specifically mentioned venereal disease and syphilis. Mimeographed copies are available.

Boys' Clubs Seek Health—Dr. Livingston Farrand heads the committee which has outlined a health program for boys' clubs under the sponsorship of Boys' Clubs of America, 381 4th Ave., New York, N. Y. An extensive manual will appear in several parts

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

treating of health service, health supervision, and health instruction. Part one, "Health Service," has been issued. Contents:

Determine the need for health service . . . Outline the proposed program . . . Obtain the interest and support of important agencies and individuals . . . Prepare a budget for the proposed program . . . Secure boys' club board of directors' approval . . . Organize the approved program . . . The program in operation . . . Recognize physical fitness of boys . . . Publicize the program.

Price to health workers, *20 cents.*

Send a Copy to the Editor—*The Health Officer* (May, 1937) quotes from *Journal of American Medical Association* and *American Journal of Public Health,* about the vicious cancer article in *Coronet,* adding comment of their own.

We hope that all who quote or comment concerning that article will send marked copies, or marked pages to *Coronet,* 919 N. Michigan Ave., Chicago, Ill.

4-H Club Health Education—Among the increasingly useful rural health education centers is the 4-H Club. A glimpse of what is being done in New York State comes from *Health News,* Albany (Dec. 21, 1936):

St. Lawrence county 4-H clubs have begun their health education program with a study of safety in the home and on the farm. A leaders' training conference was held in Canton, November 23, with an attendance of 25. S. W. Sayer, M.D., district state health officer, presided. The organization of the program was carried out by B. J. Rogers, county 4-H club agent, with the coöperation of Dr. Sayer and Mrs. Ethel M. Hendriksen of the Division of Public Health Education.

Discussion handbooks supplied by the Canton chapter of the American Red Cross were distributed together with other material for the use of leaders. Five lessons will be presented covering the prevention of falls; fires; accidents due to tools and machinery; carbon monoxide and other poisonings; care of animals.

Club member participation will be encouraged through a survey of the home and the farm for conditions which might cause accidents; preparation of short essays, posters, scrapbooks and notebooks on observations. Certain of these materials will be exhibited at the county fair.

Juvenile granges will take part in this project also.

Through this program it is possible to reach 1,000 boys and girls.

"As Long as the Supply Lasts" — Some thoughtful correspondents write to explain that they will send to health workers copies of printed matter of which they send samples to the editor. When they, very reasonably, would like to receive return postage we wish that they would mention *2 cents,* or *3 cents,* or *10 cents,* or whatever it may be.

But it seems unnecessary to add in our reference to the printed matter that samples will be sent "as long as the supply lasts." Is not that fact necessarily true in all cases, inasmuch as there can be no obligation when the supply is exhausted?

At any rate, whoever cares for samples had better write promptly before all the procrastinators get busy.

RADIO

Two reports on the A. M. A. dramatizations are available. "Dramatizing the Health Message," and "Evaluating Health Dramatizations," appeared in *A. M. A. Bulletin.* For copies write to Dr. W. W. Bauer, A. M. A., 535 N. Dearborn St., Chicago, Ill. *Free.*

"Guideposts for Producing Educational Programs," in *Education by Radio,* 1 Madison Ave., New York, N. Y. April, 1937. *Free.* Gives 16 pointers for those building a radio program, including more than a talk.

A report of the 6th annual radio contest conducted by Minnesota Public Health Assn. appears in *Everybody's Health,* 11 W. Summit Ave., St. Paul. Feb., 1937. *10 cents.*

"Man Against Germs," one of "The World is Yours" series. Ask for March, 1937, issue of *The World Is Yours*, Office of Education, Washington, D. C. *Free.*

"This is Negro Health Week," by Dr. Huntington Williams. Supplied for local adaptation. *Free.* Negro Health Week, U. S. Public Health Service, Washington, D. C.

American Medical Assn. (Tuesday, 4:00 p. m. C.S.T., blue network):

Winter health hazards . . . Don't die of diabetes . . . Scarlet fever . . . Your weight . . . Heart disease . . . Industrial accidents . . . First aid for broken bones . . . This credulous world . . . Spring athletic hazards . . . Mental hygiene.

Baltimore Health Dept. and Medical and Chirurgical Faculty of Maryland:

The collection and removal of garbage . . . How food inspectors do their work . . . Poisonous insect powders and metal polishes . . . The South Baltimore General Hospital . . . Athletics and the school girl . . . The new milk bottle caps (new official practices).

Connecticut State Dept. of Health WTIC, Thursday, 2:15 p.m.):

Marked increase in undulant fever . . . Placing the barrier against syphilis . . . Water and disease . . . Consider the eyes. . . Child health the year around . . . Public health proposals in General Assembly . . . Is mental hygiene of value?

How the public health nurse assists in disease control (May 13) . . . Mastering reality problems (May 20) . . . Irritation a factor in cancer (May 27) . . . Poisons in the home (June 3) . . . How to avoid dental decay (June 10).

Minnesota State Medical Assn. (Thursdays, 2:30 p. m., WCCO):

Women's contribution to the cancer problem . . . Senile dementia . . . Phlebitis . . . Hayfever . . . Stomatitis . . . Marking babies The use of cosmetics . . . Weight control . . . The winning fight . . . Your teeth . . . Carbon monoxide . . . Neglected head injuries . . . Myxedema . . . Crooked teeth.

New York City Dept. of Health (WNYC and WARD):

Too much acid! . . . Food and nutrition . . . Social hygiene day . . . War on syphilis! Diet for the normal person . . . Milk supervision . . . Corrective diets . . . Your shoes and your feet . . . Health after forty . . . Measles is dangerous . . . Leviticus, Chapter XV . . . Are quacks cheaper?

"Public Health and the Venereal Diseases," and "Conquering Syphilis" are broadcasts, via Station WJDX, by Dr. Felix J. Underwood. For printed copies address State Board of Health, Jackson, Miss.

American Medical Assn.:

A fight half won (tb.) . . . Keeping your baby well . . . Healthy mothers . . . Hospitals of today . . . Whooping cough . . . Your summer vacation . . . Doctors assembled.

Baltimore Health Dept. and Medical and Chirurgical Faculty of Maryland:

Baltimore and its ice cream supply . . . Health milestones . . . Rôle of the Y.M.C.A. in the health of Baltimore's youth . . . The activities of the Bureau of Street Cleaning . . . Superstitions in medicine . . . A health officer investigates typhoid fever (dialogue).

Connecticut Dept. of Health:

Allowing the child's personality to develop . . . By their food you may know them . . . How the public health nurse assists in communicable disease control . . . Mastering reality problems (mental hygiene) . . . Irritation: a factor in cancer . . . Helping the teeth to develop.

Hartford Board of Health:

Important knowledge about syphilis.

Hartford Medical Society and Hartford Tuberculosis and Public Health Society:

Child health in Hartford . . . Body mechanics and health . . . All sugar is not sweet . . . Today's dental problems.

Minnesota State Medical Assn.:

Some major health problems . . . Nervous exhaustion . . . Artificial dentures.

New York City Department of Health:

Left-handed chivalry (syphilis) . . . Your child's health . . . Don't ignore hoarseness

. . . Is your child safe? . . . Spring sports . . . Bleeding gums . . . What your baby needs . . . Hay fever time . . . The secret of a good complexion . . . Nature's ancient remedies . . . After the baby is born . . . High blood pressure . . . Your health department and your child.

DATES AHEAD

June, July, August, 1937, in New York City: Health Education Calendar offered by Health Education Section of Welfare Council urges attention to "Summer Health," including maternal and child health, summer care, nutrition, safety and prevention of accidents, getting the preschool child ready for school. For further information address the Health Section at 44 East 23d St., New York, N. Y.

NEW

News Letter, mimeographed bulletin of New York Diabetes Assn., 386 4th Ave., New York, N. Y.

Quarterly Bulletin, Assn. of Dairy, Food, and Drug Officials of the U. S., Care of State Dept. of Health, Louisville, Ky. The first two issues carry material from the 40th annual conference.

One of the newest of the illustrated magazines is *Foto,* 149 Madison Ave., New York, N. Y., *10 cents. Foto* carries condensed text with its pictures which supplement the latter more successfully than some of the other illustrated periodicals. The Aug., 1937, issue devotes two pages to "Miss Anatomy," a demountable model which seems to be more satisfying to the audience than the "transparent" type.

The newest of pocket size magazines is *They Say,* 112 E. 19th St., New York, N. Y. *25 cents.* "Health and psychology" is one of the 13 "fields of basic interest" to be covered. Several devices are offered for reader participation, including monthly postal card debates. In May, 1937, issue:

Drunken driver Nemesis (how a Pittsburgh judge actually jailed driving drunks and judge associates objected) . . . What people like to read—and why (a study of popular magazines and elements in popular writing success) . . . 37,000 auto deaths . . . Sex racketeers promote prudery (handicaps to sane sex education) . . .

Popular Photography (608 S. Dearborn St., Chicago, Ill.) is a popular magazine for the amateur. To a nonphotographer it seems to offer much usable material for the health worker who uses a camera, or who is responsible for photographic work by a staff member or an outsider. *25 cents* a copy.

FOR EDUCATION OR REFERENCE

"Health Education Publications." A new list of A.C.H.A. and Joint Committee material. National Education Assn., 1201 16th St., N. W., Washington, D. C. Ask also for list of School Health Education Service reading lists.

"Here and There with the Health Reporter" for May and June is devoted to "reducing safely and sanely. It can be done—but it must be done slowly and carefully." Mats will be supplied. For newspapers, and for health periodicals. Health News Service, 22 E. 40th St., New York, N. Y.

"Humanization of Science," by Dr. Iago Galdston. An address before the Tuberculosis and Health Society of St. Louis. Copies from the author, 2 E. 103d St., New York, N. Y.

"Insects" (injurious to man, etc.). List of government publications for sale by Superintendent of Documents, Washington, D. C. *Free.*

An International Health Congress in the course of the New York World's Fair has been announced. A copy of the statement to the press will be sent to public health workers who care to write to National Health Council, 50 W. 50th St., New York, N. Y.

Two illustrated folders on syphilis as a cause of blindness have been issued by National Society for the Prevention

of Blindness, 50 W. 50th St., New York, N. Y. Samples *free* to health workers.

"Wholesale Life Saving" is "an informal report on the Health Conservation Contests sponsored by the U. S. Chamber of Commerce and the A. P. H. A., and supported by life insurance companies. Good looking but not expensive looking. Blue cover with title outlined in imitation of a rope; nearly square page; little margin at sides, but plenty of white space at top and bottom; unusual for a health publication.

A new price list of publications is available. American Medical Assn., 535 N. Dearborn St., Chicago, Ill. *Free.*

"Be Kind to What Animals?" by V. Heinen. Animal experimentation as seen by a Roman Catholic. Reprint. American Medical Assn. *10 cents.*

"Whom Shall I Consult—Optician, Optometrist, Oculist, Ophthalmologist, or Opthalmic Physician?" by L. L. McCory. Reprint. American Medical Assn. 4 small pages. *10 cents.*

Reprints from *Public Health Nursing* (50 W. 50th St., New York, N. Y.) at *10 cents* each:

"The Function of the Public Health Nurse" . . . "The Delivery Visit" (a time study) . . . "Twenty-five Years Ago" . . . "An Industrial Nurse Writes Her Annual Report" . . . "Use of Cars by Public Health Nurses" . . . "Twenty Years of Orthopedic Nursing in Boston" . . . "What Pattern—Staff Education?" . . . "Nursing in the Toxemias of Pregnancy."

HEALTH EDUCATION

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Hiscock, I. V. For the enrichment of childhood. Journal of health and physical education (Ann Arbor, Mich.) 8:74–77, February, 1937. Discusses three phases of a health education program; public health education, school health education, and health education of professional groups.

Jean, S. L. Current developments in school health education. Journal of school health (Buffalo, N. Y.) 7:11, January, 1937. This magazine was formerly School physicians bulletin.

Mikalonis, Mary. Teaching mouth health to children in a private practice. Journal of the American dental hygienists' association (Stratford, Conn.) 11:3–7, January, 1937.

Rice, T. B., M.D. What shall we teach in hygiene? Monthly bulletin, Indiana division of public health (Indianapolis) 40:3–4, January, 1937. Second of a series of articles.

Shiels, T. D., M.B. Aims and methods in health education. Medical officer (London) 57: 87–89, February 27, 1937.

Westfall, M. H. The dental health program in Indiana. Monthly bulletin, Indiana division of public health (Indianapolis) 40:8–9, January, 1937.

WHAT HAS BEEN USED

"Better Health Week." An 8 page program of meetings, movies, exhibitors, etc., in Bronx Borough. Bronx Tuberculosis and Health Committee, 226 East Fordham Road, New York, N. Y.

"Syphilis—and the 'Conspiracy of Silence.'" Folder of 4 pages, each nearly letter size. Inside a double page spread shows a diagram in red and black, titled "Syphilis—A Family Problem." Diagram starts with a telephone call about a family of 7 and a boarder; indicates steps taken with each one of the 8 persons, and the 14 services rendered in relation to the syphilis problem by the A.I.C.P., 105 E. 22d St., New York, N. Y. Closing paragraph of the 2 pages of text says:

> Even those who cannot afford to contribute money to this purpose, can contribute *understanding*; for it is only when the conspiracy of silence is ended, and the facts about syphilis are as widely known as the facts about tuberculosis, that we can except to bring the disease under control.

"Tomorrow's Health Depends Upon Today's Prevention" is the keynote of a mimeographed letter from the University Health Officer to faculty mem-

bers and employees of the University of Illinois. Address Dr. J. Howard Beard, Champaign, Ill.

"You and Your New State District Tuberculosis Hospital." A large page, 8 page pamphlet describing and illustrating 3 new hospitals and the territories they serve. S.C.A.A., 105 E. 22nd St., New York, N. Y.

MAGAZINE ARTICLES

Health information in a magazine has a value quite apart from the effectiveness of what is distributed by a health agency. Even the comparatively limited number of copies of any magazine reaching a community is to be reckoned with by the health educator. All that can be reasonably done to extend the circle of readers is a desirable phase of the local health education program.

We see all too few references in health bulletins to current magazine articles.

"Before and After Forty," by C. H. Mayo, M.D. "Preventive medicine holds great promise for man." A distinguished physician shows what it means to us in our everyday existence. *Rotarian,* 35 E. Wacker Drive, Chicago, Ill. June, 1937. *25 cents.*

"Better Babies: Trend in America is Not to More, But to Healthier Infants." Tells of gadgets and services intended to facilitate the trend. *Literary Digest,* 354 4th Ave., New York, N. Y. May 8, 1937. *10 cents.*

"A Drop To Drink," by Dr. V. G. Heiser. "There's so much water around us that we don't give it much thought. But the guardians of our health do. If it weren't for their quiet labors, there'd be lots fewer of us to read this article." *Colliers.* April 24, 1937.

"Home Accidents Killed More Than Autos in 1936," and how to prevent them is demonstrated in 2 pages of pictures in *Look,* 715 Locust St., Des Moines, Iowa. June 8, 1937. *10 cents.* Something to do something about—and so much easier than some others.

"Warnings for Sun-tan Worshipers." Warnings; limited substitutes. "Sick Brains: Psychiatrists Study Mental Disorders That Afflict Thousands of Americans." "Pied Piper." Mentions "The House Rat" issued by Department of Agriculture; guesses of "rodent census." *Literary Digest.* May 29, 1937. *10 cents.*

"Wheeled Nomads: Health Hazards" ("Trailers frighten state and local sanitation officers"). "Fanged Cure: venom for Snake-bite and Toads for Heart Trouble." "Life's Capsule" (based on paragraph in Rockefeller Foundation report). *Literary Digest.* May 15, 1937. *10 cents.*

"Should My Child's Tonsils Be Removed?" By Dr. H. F. Helmholz. "The answer to a question being asked in many households today." *National Parent-Teachers,* 1201-16th St., N. W., Washington, D. C. June, 1937. *15 cents.*

"Ten Million Straining to Hear" ("Deafness, cruel to victims, is alleviated by new devices"). "New Hope" ("Medical research takes another trench in unceasing war against cancer"). *Literary Digest.* May 29, 1937. *10 cents.*

"Uncle Sam, M.D.," by P. A. Williams. *Nation's Business,* Washington, D. C. May, 1937. Reprint *free* from Medical Society of State of New York, 2 E. 103d St., New York, N. Y. The "other" side of compulsory health insurance.

BOOKS AND REPORTS

The Environment and Its Effect Upon Man—*By the Harvard School of Public Health. Boston,* 1937. 297 pp. Price, $3.50.

Man's environment is a subject for philosophers and political economists, and forms the core of all public health study. The present volume is an effort to correlate a few of the many aspects of the subject. It is a compilation of the papers presented at the symposium held at the Harvard School of Public Health, August 24–29, 1936, as a part of the Harvard University Tercentenary Celebration.

Nineteen papers are presented, chiefly by the staff of the School of Public Health, but also several others. The subjects comprise: The effects of social environment, industrial fatigue, air-borne infection, heat and humidity, abnormal air conditions in industry, high pressures, industrial operations in compressed air, carbon monoxide poisoning, toxic organic vapors and gases, dusts and fumes, pneumoconiosis in its various relations, air conditioning in normal life and in hospitals, and the organization and equipment of industrial hygiene laboratories. Except the paper on air-borne infection and its sanitary control, which appeared in *The Journal of the American Medical Association,* all of the papers have been published in *The Journal of Industrial Hygiene and Toxicology.* Illustrations, charts, tables, and extensive bibliographies accompany. An index is omitted but this seems unnecessary in view of the nature of the compilation and the Table of Contents.

The volume makes available a very handy source of access to these valuable papers, all compiled by experts in their respective fields and representing our latest thought.

EMERY R. HAYHURST

United States Life Tables, 1930—*Prepared under the supervision of Dr. Joseph A. Hill. Bureau of the Census, U. S. Department of Commerce. Washington: U. S. Government Printing Office,* 1936. 57 pp. Price, $.75.

The new volume of complete life tables will be gratefully received by students of vital statistics, since there have been no complete tables published by the Census Bureau subsequent to those based on the population returns of the 1910 census. There are 26 complete life tables included in the present volume, 6 of which are reprints of tables number 8 to 12, prepared by Professor Glover, giving the life table functions for white males and for white females in the original Registration States, based on reported deaths for the years 1900 to 1902, 1901 to 1910, and 1909 to 1911. The 20 new tables are specific for both color and sex, 16 of them giving the life table functions for each of the 4 color-sex groups in Continental United States, based on the mortality of 1929 to 1931, and in the 1920 Registration States based on the mortality of 1919 to 1921, 1920 to 1929, and 1929 to 1931. Two further tables give the mortality for white males and for white females in the original Registration

States, 1929 to 1931, thus premitting a comparison with the tables quoted from Glover, which are for the same population groups at earlier dates. The last 2 complete tables show the mortality, exclusive of deaths from tuberculosis, for white males and white females in the Registration States for 1920, in the years 1920 to 1929.

The tables just listed tabulate the life table functions for each year of age, but the 8 tables relating to the original Registration States are further expanded by a tabulation of the functions for monthly subdivisions of the first year of life, the 2 most recent tables subdividing the first month into still finer divisions.

It is not necessary to point out to those who are acquainted with Glover's Tables, and Miss Foudray's Abridged Life Tables of 1920, the great utility of this new volume. The fact that, like the 1910 tables, the functions are tabulated for each year of age, makes them especially valuable. Two features of these earlier publications of the Census Bureau will, however, be missed in this latest volume, one being the raw data on which the life tables were based, and the other a description of the procedure by which the life table functions were derived from the raw data. The former omission is especially regrettable since the Registration Area was not complete in 1930 and the mortality figures are partly estimated.

The procedures used in preparing the tables were selected or devised by Miss Foudray of the Census Bureau, and reviewed by Professor Glover. It would be of interest to have them outlined, particularly for the life tables in which the deaths from tuberculosis are omitted, since various assumptions might be made with regard to the mortality of those now dying from tuberculosis if this cause of death were eliminated. The lack of statement as to what assumption was made leaves the interpretation of the table in some doubt.

The selection of tables to be included seems to be very fortunate for a wide variety of applied problems. It is very much hoped that it will be possible for the Census Bureau to make such tables a routine part of its publication program.

MARGARET MERRELL

Research in Dementia Praecox (Past Attainments, Present Trends and Future Possibilities)—*By Nolan D. C. Lewis, M.D. New York: National Committee for Mental Hygiene,* 1936. 320 pp. Price, $1.50.

It is a mark of progress when a social organization recognizes one of the most serious problems of mankind. This publication was made possible through the aid of the Supreme Council, 33rd° Scottish Rite Masons of the Northern Jurisdiction, U. S. A.

In the introduction—research trends in mental disorder—the difficulties involved in dealing with the field of psychiatry are considered. The complex variables, the lack or impossibility of applying experimental technics, the physiologic and psychologic contrasts are a few factors discussed. Tables are presented to show the numerical distribution of 1,778 papers, monographs, and books in 12 languages during the years of 1920 to 1934.

The clinical features of dementia praecox are described from the historical point of view. For practical purposes the Kraepelinian types are delineated, with emphasis placed upon the need for a new and more comprehensive classification of the praecox group. Some of the directions in which psychology might contribute would be: (1) formulation of the "natural history" of the development of the disorder in the individual, (2)

hallucinations and eidetic imagery, (3) problem of deterioration, (4) application of the Rorschach and Vigotsky technics, and (5) "schizophrenic" language. The future contribution of psychoanalysis to the understanding of the disorder is anticipated. The value that might be derived from studies in the child guidance clinics which deal with problems of early life adjustment is mentioned.

Under etiological aspects, the need to investigate the disorder in primitive peoples is indicated. The epidemiologic method, studies of heredity, race, and the releasing causes are also necessary.

The difficulties in the diagnosis of dementia praecox are discussed with a series of observations to illustrate this. Especial attention is given to the differences between psychoneurosis and dementia praecox and the differential diagnosis of dementia praecox from manic depressive psychosis, paranoia, paranoid dementia praecox, and the hebephrenic types.

Therapy in dementia praecox must be instituted at present on an empirical basis.

In the author's conclusions, he states "mental disorders are created by what might be called a set of external irregularities or 'instabilities' acting upon a set of internal 'instabilities.'" A plan for procedure in psychiatric research is elaborated upon. "A rigid standard of thorough penetrating analyses and carefully considered syntheses" must be maintained.

JOSEPH J. MICHAELS

Feeding Our Children—*By Frank Howard Richardson, M.D. New York: Crowell,* 1937. 159 pp. Price, $1.00.

The complexity of factors entering into the problem of nutrition has made it difficult to express in simple, straightforward terms the practical aspects of this subject. How is the modern mother and housewife to winnow the wheat from the chaff? Dr. Richardson has attempted in brief compass to set forth "a simple and understandable exposition of the principles of nutrition, together with their practical application of the task of planning meals for the various ages." In the main he has succeeded, although in certain parts it is over-simplified for those who would like more basic material. He has followed largely the works of McCollum, Sherman, Holt, Rose, and Peters, to which he gives due credit in his foreword.

The most helpful part of the book from the standpoint of the harassed and perplexed mother should be the chapters applying the principles of nutrition to different age levels. The author reveals a practical knowledge of child psychology, and in his chapter on "when a child refuses to eat," sets forth simple rules which he claims have worked in his practice. There is nothing especially new in the content of this book, although the method of presentation is unique. R. A. BOLT

Second Symposium on Silicosis *(Saranac Lake)—By B. E. Bekuechle, Editor. Wausau, Wis.: Employers Mutuals,* 1935. Paper, 194 pp. Price, $3.00.

This report follows the one of similar title issued in 1934. Principal papers were followed by discussions, and these summarized by Dr. Leroy U. Gardner without attempt at verbatim report. Where possible, the discussants were asked to approve the final copy as here published. Avoidance of technical language was attempted.

The principal papers were those by: R. R. Sayers and R. R. Jones, on Etiology of Silicosis; D. E. Cummings, on Dust in Atmosphere, Occupational History, and Administrative Control;

Leroy U. Gardner, on Pathology of Silicosis, and Correlation between Anatomy and X-Ray Appearance; W. S. McCann and N. L. Kaltreider, on Physiology of the Fibrotic Lung; H. K. Kessler, on Clinical Aspects; D. M. Brumfiel, on Census of Cases of Pneumoconiosis in Tuberculosis Sanatoria; E. P. Pendergrass, also H. L. Sampson, on Roentgenological Diagnosis; A. R. Riddell, on The Clinical Picture and Its Importance and Medical Methods in Control; Philip Drinker, on Engineering Methods in Control; and A. J. Lanza, on Silicosis as a Social Problem.

There is a wide range of compact thought in this volume, both in the findings and opinions of leading specialists, and the discussions which they occasioned. Unfortunately the volume is not indexed and it is necessary for the reader to do some intensive work to get at its contents. Some of the papers are sub-headed and there are a number of valuable outlines and charts. That by McCann has several full-paged half-tones of chest roentgenograms. The volume is indispensable to all who are interested in the subject of silicosis. EMERY R. HAYHURST

Memoranda of Toxicology—*By M. Trumper. (3rd ed.) Philadelphia: Blakiston.* 304 pp. Price, $2.00.

A brief summary of the toxic effects, treatment and detection of various poisonous substances. The author has condensed the subject to a few paragraphs on each poison in such a manner that it should prove valuable to the practising physician in an emergency. It is not a scientific treatise but contains the essential facts saving the doctor the trouble of going through the literature. The book although small in size compares favorably in the given facts with some of the newer and larger volumes on the same subject.

FREDERICK B. FLINN

The Sanitarian and His Duties—*By Grace L. Loye, M.S. Foreword by K. F. Meyer, Ph.D. Ann Arbor, Mich.: Edwards Brothers, Inc.,* 1937. 200 pp. Price, $1.00.

This analysis of inspectional duties in the fields of health and sanitation, together with suggestions as to requirements of sanitary inspectors formed the basis of a dissertation by the author in the Department of Public Administration of the University of Southern California. The volume aims to stimulate improvement in services, to aid in the formulation of qualifications and standards, and to serve as a foundation for future studies in this field. If the volume merely attracts attention to some of the complexities of the present problems of service and training, it will serve a useful purpose—but it is anticipated that this contribution will gain the interest of teachers, health officials, and members of committees who are attempting to define the scope of the sanitary officer's position and his qualifications, and to provide practical training opportunities.

An introductory chapter outlines effectively the development of inspectional services and emphasizes the need of more consideration of the problem.

> One of the principal conclusions which forces itself upon investigators in this field is the serious need for adequate standards. Those standards which do exist arose mainly in response to local needs and out of custom and usage. There is, however, no adequate standardization of inspectional procedure or objectives, with the result that both the public and governmental officials are uninformed concerning inspectional activities. The inspectors in the main, create their own standards of inspection, restricted only by departmental rules and policies. This obviously makes for great variance in inspectional methods and procedures and undoubtedly has a deleterious effect on the morale of the inspector, for, without standards to guide him, he tends to become more or less indifferent and lax in the performance of his duties. . . . Perhaps the greatest need of inspectors, however, is adequate training. . . .

The untrained layman or political appointee is no longer able to execute these duties properly.

It is observed that the need for adequate inspectional standards is felt keenly by the inspectors themselves.

The analysis is developed on a unit basis, an attempt being made to include in outline form the essential features of inspection in each unit. For example, under the unit of Housing are presented three major type situations with several sub-headings. In parallel columns opposite these situations are listed items of required information. This material dealing with the knowledge and abilities required of sanitary inspectors under "Required Information" is sub-divided into "Technical" and "Auxiliary." The content is further classified under specific titles, such as science, laws and regulations, forms and records, finance, safety measures, and public relations. While there will be some difference of opinion regarding the details of this classification and the suggestions as to the information which an inspector should possess, the author has made a valuable contribution to the analysis of this phase of public health administration.

IRA V. HISCOCK

Life and Death: The Autobiography of a Surgeon—*By Andrea Majocchi. New York: Knight Publications,* 1937. 300 pp. Price, $2.75.

This extremely interesting book is written by a man who has the reputation of being Italy's foremost surgeon. It is the story of a man who is evidently brilliant, a student, and a humanitarian. Sincere autobiographies, even by less noted persons, are always interesting and valuable. We have found this book above the average of its class. It is particularly interesting to pathologists and bacteriologists to read that the author was a classmate of Negri, who discovered the bodies in rabies known by his name and which are universally used for rapid diagnosis.

We are naturally interested in his observations of America—all the way from the Chicago slaughter-houses to the surgical clinic at Rochester, in which he finds certain American ideas and methods which are similar! He admired the vast strides made in this country in operative technic. He found many brilliant operators but few outstanding clinicians. American surgeons are noted for their skill; the operating rooms perfect, and the work admirably distributed, but he "left this land of miracles without much regret." He found the cities totally lacking in artistic interest and lacking in the warmth of his "beloved Europe—and Italy."

He speaks of nurses as guardian angels and pays them the highest tribute. Of American nurses he says they are practical rather than idealistic; that they have created a definite type which is a salient feature of surgical hospitals. They are recruited from the well-to-do and cultured, not from the lower classes. They are required to have a general cultural background as well as a good medical education. He has elsewhere written at length of the admirable discipline of our nursing schools and holds that the American nurse has a culture and practical value which is definitely outstanding.

A most interesting chapter is devoted to the so-called miracles at Lourdes, where he went one season as physician to a large group of Italian pilgrims. His story of this visit is thrilling as an adventure. He is a devout believer, we may suppose—at least he was not antagonistic in his observations. His whole life shows him to be most human and most sympathetic, and among his charges on this memorable visit were some who enlisted his sympathies to the utmost, yet he ends with these words: "All these

people, who had gone to Lourdes to be cured, had made sacrifices, and had undergone agonizing pain because of the inconveniences of the traveling, without obtaining the slightest alleviation of their misery. Yet they returned home resigned, comforted, serene. Not a word of discouragement, not an accent of rebellion."

The last chapters are devoted to thoughts of old age, and the inevitable end. The "icy" thought of death often assails him. He forgets it by work and devotion to the sufferings of the ill and unfortunate. "What a godsend work is to the man who is growing old!" he says. He asks what the aim of life is, why there should be suffering, why war with its terrible battles, suffering, and death. He reviews his life, finds that often he could have done better, and concludes that during his last years of activity he must multiply his good deeds and do more efficient work than he has ever done before. His dying prayer will be the words which he had engraved on his mother's tomb: *"In te, Domine, speravi, non confundar in aeternum!"*

This is a delightful book, much more than something to be taken up during an idle hour.

MAZŸCK P. RAVENEL

Official and Tentative Methods of Analysis—*By W. W. Skinner, Chairman Editorial Board, Assisted by a Committee of the Association of Official Agricultural Chemists.* (4th ed., 1935). Washington, 1936. 710 pp. Price, $5.00.

This association includes officials of state departments of agriculture, state agricultural colleges and experiment stations, the U. S. Department of Agriculture and the federal, state and city offices charged with the enforcement of food, feed, drug, fertilizer, insecticide, and fungicide control laws. Founded in Philadelphia in 1884, it has continued active through the years in perfecting and adopting methods of analysis useful in this control work.

Beginning with the first edition of the *Methods of Analysis* issued in 1920, these tentative and official methods which were previously published in the *Journal* of the Association have appeared in 4 successive volumes.

The present volume has increased in size over the 417 pages of the 1st edition to 710 pages. While 41 chapters on methods are indicated, the places of 6 of these are marked with an asterisk as they are to include methods which the association has only begun to prepare or plans to prepare. These 6 chapters are to cover sewage, agricultural dust, fish and other marine products, vitamins, bacteriological and microchemical methods.

The remaining chapters cover the methods usually included in the report: soils, fertilizers, agricultural liming materials, insecticides, fungicides, caustic poisons, naval stores, paints, varnishes, leathers, tanning materials, plants, non-alcoholic beverages and concentrates, malt beverages and brewing materials, wines, distilled liquors, baking powders, coffee, tea, cacao bean and products, cereal foods, coloring matters in foods, dairy products, eggs and egg products, flavoring extracts, fruits and fruit products, grain and stock feeds, meat and meat products, metals in foods, nuts and nut products, oils, fats and waxes, preservatives and artificial sweeteners, spices and condiments, sugars and sugar products, vegetables and vegetable products, waters, brine and salt, radioactivity, and drugs. The chapters covering fibers, paper and paper materials which appeared in the 3rd edition are, however, no longer included. Reference tables are included as in previous editions, and, in addition, two useful appendices. The first of these presents methods for the preparation and standardization of

solutions and the second includes a revised and enlarged section on definitions of terms, and interpretation of results on fertilizers and liming materials.

The chapter on dairy products of this report has been used as the basis for the Chemical Methods of Analyzing Dairy Products which forms part of the report previously known as Standard Methods of Milk Analysis issued by the American Public Health Association. They are to be used again in the 7th edition of this well known report now in process of preparation. A description of the standard A.P.H.A. procedure for determining sediment in milk and cream is included (p. 275).

The care taken in testing these methods before they are approved and the clarity with which they are presented has given this report a reputation and standing in laboratories and in the courts that is unexcelled. For this reason this report should be available in every public health laboratory that may be called upon to make analyses of any of the products or materials for which methods are given.

ROBERT S. BREED

Our Children in a Changing World—*By Irwin Wexburg, M.D. with Henry E. Fritch. New York: Macmillan,* 1937. 232 pp. Price, $2.00.

The authors of this book have rendered a significant service to all those interested in the general and specific problems of maladjusted children. The easy reading style, the large number of specific case references, and the arrangement of content make for enjoyable and profitable reading not only by the intelligent lay person but also by the physician, psychologist, psychiatrist, social worker, and teacher.

Following an introduction which pays tribute to the unique contributions of Alfred Adler's individual psychology which permeates the genetic-dynamic methodology of presentation in this book, we find the book divided into 3 parts: Part I concerns itself with the development of the personality and 5 factors of environment—physical, social and economic, sex, family constellation, and education. Part II deals with special problems such as the criminal child, those maladjusted by virtue of lying, over-ambition, the " model child," timidity, selfishness, laziness, and the stupid child. A section is devoted to bad habits and nervous symptoms such as eating difficulties, thumb sucking, nail biting, tics, restlessness, disturbances of speech, bed wetting and uncleanliness, and sexual misbehavior. Part III is devoted to education and corrective measures.

The soundness of the content of this book is unquestionable, buttressed by actual experience, and the interpretation and handling of varying degrees of child maladjustments. The keen insight as well as philosophic approach which give breadth to the understanding and direction of problem behavior are commendable.

The book is rounded out by a well chosen Index. The fresh, crisp manner of style, and particularly the common sense interpretations which take root in critical experience should strongly appeal to all those who are desirous of obtaining a better working knowledge of the multiplicity of problem behavior of childhood.

FREDERICK L. PATRY

The Mentally Ill in America: A history of their care and treatment from Colonial times—*By Albert Deutsch. With an introduction by William A. White, M.D., Sc.D. Garden City, N. Y.: Doubleday, Doran,* 1937. 530 pp. Price, $3.00.

With growing recognition that mental and emotional problems form an essential and very important part of the public health program, this book

should be of vital interest to all health workers.

Deutsch has given us an admirable picture of the development through the centuries of a sound community attitude toward such problems. As in most fields of scientific thought, certain Greek writers took a thoroughly constructive view of mental disease while throughout the Middle Ages this viewpoint was forgotten. In this volume we see the more recent beginnings of a scientific and humane attitude in Benjamin Rush, carried forward by Dorothea Dix, and at last finding its fruition 30 years ago under the stimulus of Clifford Beers.

We note many changing attitudes during the last century and a half. The pendulum swings back and forth between extravagant optimism with claims of 100 per cent cures of the mentally ill and indefinite perfectability of the feebleminded to black pessimism in which the menace of increasing mental disease overshadows the future of the human race. Gradually science and humanity make a slow but sure advance, reaching their peak (for the moment) in the best institutions of today and in the development of a comprehensive but sane program for community mental hygiene. Such a scholarly review as this has long been needed and it will form part of all our thinking in regard to the vital public health problems with which it deals.

C.-E. A. WINSLOW

BOOKS RECEIVED

A TEXTBOOK OF APPLIED BIOCHEMISTRY FOR PHARMACISTS AND PHARMACEUTICAL STUDENTS. By Frank Wokes. Baltimore: Wood, 1937. 522 pp. Price, $5.00.

FEDERAL AND STATE CONTROL OF MILK PRICES. By James A. Tobey. Chicago: International Association of Milk Dealers, 1937. 42 pp. Price, $2.00.

PUBLIC MEDICAL SERVICES. A Survey of Tax-Supported Medical Care in the United States. By Michael M. Davis. Chicago: University of Chicago Press, 1937. 170 pp. Price, $1.50.

EVERYDAY FIRST AID. By Walter Frank Cobb. New York: Appleton-Century, 1937. 269 pp. Price, $1.50.

SAFETY THROUGH CHILDBIRTH. A Guide for the Expectant Mother. By A. J. Rongy. New York: Emerson, 1937. 192 pp. Price, $2.00.

CHILDBIRTH YESTERDAY AND TODAY. The Story of Childbirth Through the Ages to the Present. New York: Emerson, 1937. 192 pp. Price, $2.00.

LEARNING TO BE GOOD PARENTS. Talks to Fathers and Mothers. By Eleanor Saltzman. Boston: Manthrone & Burack, 1937. 55 pp. Price, $.25.

BACTERIOLOGY. A Textbook of Microorganisms. By Fred W. Tanner. 3d ed. New York: Wiley, 1937. 510 pp. Price, $3.50.

TAKE CARE OF YOURSELF. A Practical Guide to Health and Beauty. New York: Simon & Schuster, 1937. 287 pp. Price, $2.00.

HEALTH EDUCATION OF THE PUBLIC. A Practical Manual of Technic. By W. W. Bauer and Thomas G. Hull. Philadelphia: Saunders, 1937. 227 pp. Price, $2.50.

AMERICAN RED CROSS LIFE SAVING AND WATER SAFETY. Prepared by the American Red Cross. Philadelphia: Blakiston. 267 pp. Price, $.60.

A FIVE-YEAR STUDY OF TUBERCULOSIS AMONG NEGROES. New York: National Tuberculosis Association, 1937. 77 pp. Price, $.50.

DIGEST OF TREATMENT. Volume 1, Number 1. July, 1937. George E. Rehberger, General. Editorial Adviser. Philadelphia: Lippincott, 1937. Subscription, U. S. A., $5.00, Canada, $5.50, Foreign, $6.00.

HEALTH IN COLLEGES. Report of the Second National Conference on College Hygiene, Washington, D. C., Dec. 28–31, 1936. New York: National Tuberculosis Association, 1937. 128 pp. Price, $1.00.

FOOD TECHNOLOGY. By Samuel C. Prescott, Sc.D., and Bernard E. Proctor, Ph.D. New York: McGraw-Hill, 1937. 630 pp. Price, $5.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Diphtheria Experience in 1936—Among the large cities, fewer had excessive death rates from diphtheria than a year ago, but the number that had none remained the same. Where general immunization was approached, there the rates were lower.

ANON. Diphtheria Mortality in Large Cities of the United States in 1936. J.A.M.A. 108, 26:2200 (June 26), 1937.

Current Typhoid Fever Deaths—Again the large cities report a reduction in typhoid fever mortality rates. In the South, persistence of typhoid in rural regions materially handicaps the cities. There the rates are highest; they are lowest in the Atlantic seaboard and New England states.

ANON. Typhoid in the Large Cities of the United States in 1936. J.A.M.A. 108, 25: 2118 (June 19), 1937.

Poliomyelitis Among Nurses—A study of nurses who contracted poliomyelitis in Los Angeles, considers the care and treatment needed, their eligibility for Workmen's Compensation, and the after-effects reported. Recommendations regarding the selection and protection of nursing personnel in epidemics are given.

ANON. Results of Poliomyelitis Among Nurses. Am. J. Nurs. 37, 6:620 (June), 1937.

Nasal Immunization — Editorializing upon the Danish report of the successful immunization of children against diphtheria with intranasal instillations of alum-toxoid, this British paper asks for more experiments with the method.

ANON. New Methods of Immunization Against Diphtheria. Lancet. 1, 16:934 (Apr. 17), 1937.

Psychiatry and Sociology—In the interest of clarifying the relationship between psychiatry and sociology, the Editor of the American Journal of Sociology has devoted an issue to a symposium on the psychiatric interpretation of human society, with contributions by 7 psychiatrists, representing different points of view, a cultural anthropologist, and a social psychologist.

ADLER, A., *et al.* Symposium: The Contribution of Psychiatry to the Understanding of Human Society. Am. J. Soc. 42, 6:773 (May), 1937.

Where Venereal Disease Is Disappearing—Enthusiastic reports are made about the "liquidation" of prostitution in Russia resulting, so it is said, from these factors: women work on equal terms with men; labor is in great demand; divorce is facilitated; prophylactoria take care of the few remaining prostitutes; and enthusiasm for the national cause has changed sex behavior. Fine, if true.

CULVER, E. H. An Experiment in Social Hygiene. Brit. M. J. 3986:1120 (May 29), 1937.

Rats—Some absorbing action photographs of rats making improperly set hawser rat-guards look silly. Interesting to sanitarians ashore as well as afloat because they suggest what a determined rat really can do.

DENNY, O. E. Some Experiments with Rats and Rat Guards. Pub. Health Rep. 52, 23:723 (June 4), 1937.

Public Health Nursing for Crippled Children—A comprehensive description of the duties of the public health nurse in her service to crippled children, this paper explains the prepa-

ration needed in order to perform such service adequately, and lists the schools which have accredited courses for physical therapy technicians which conform to the standards adopted by the A.M.A. in 1936.

DEUTSCH, N. The Rôle of the Public Health Nurse in Services for Crippled Children. Pub. Health Nurs. 29, 6:350 (June), 1937.

Old Man River—What caused the weather, the rain resulting from the weather, the damage the water did, and some partially preventive measures are all discussed by men who should know most about this important, interesting, and difficult subject.

DEVEREAUX, W. C. Precipitation, River Stages, and Forecasts in the Ohio River Flood of 1937.

POHL, H. H. Ohio River Flood Control Plan.

BROSSMANN. Flood Protection in the Ohio Valley. American Journal Water Works Association. 29, 5:581 (May), 1937.

Cleaning Shell Fish—How oysters and mussels from polluted beds are rendered safe with chlorin treatment is described in this British journal. Oyster enthusiasts will bridle at the statement "it may be taken as an admitted fact that shellfish are, at best, a dirty and not infrequently a dangerous food." Perish the thought!

DODGSON, R. W. Shellfish and the Public Health. Pub. Health. 50, 9:279 (June), 1937.

Urging Pasteurization of Milk—Displaying statistics that indicate no significant decrease in the number of milk-borne outbreaks of communicable disease in the last 10 years (because most outbreaks occur in small communities where milk supplies are not conveniently pasteurized), the advantages of safe milk are reviewed.

FRANK, L. C. Pasteurization, the Indispensable Safeguard. Month. Bull., New Haven Department of Health. 44, 6:2 (June), 1937.

Poisoning from Foods—Custard cake filling is reported again as the source of a food poisoning epidemic. It seems time to do something about this in a big way. Canned antipasto, too, made a Thanksgiving feast hideous.

GEIGER, J. C. Report of Two Outbreaks of Food Poisoning. Pub. Health Rep. 52, 24:765 (June 11), 1937.

Visiting Housekeepers—An evaluation of the benefits rendered by a New York housekeeper service would lead one to believe that it has an indispensable part to play in modern health administration and social work. This is an extremely interesting, detailed account of the valuable work done by one organization. Health workers who read the article will wish that this service were available in many more communities.

HICKS, L. T. Evaluating the Visiting Housekeeper. The Family. 18, 4:124 (June), 1937.

Is the Private Relief-Giving Agency Needed?—The U. S. Children's Bureau summary of urban relief statistics, 1929–1935, showed that in 1929 private funds supplied 23.5 per cent of the total family relief in large cities: by 1935 the amount had decreased to only 1.4 per cent. The author discusses the need for the private agency in the realm of relief-giving. His conclusions are that for the present there is much need for this supplementary relief service and that the need is likely to continue. Health workers will be interested in the analogy of these findings to the field of public health.

HURLIN, R. G. Relief in Private Family Agencies in the Post-Depression Period. The Family. 18, 4:121 (June), 1937.

Too Late?—Plotting the age of authors at the time their best books were written (usually before age 45) and sampling the time lag between

writing and publication, the conclusion is reached that best books are written while the authors are still in their 30's. This will be bad news to graying sanitarians who still harbor the secret desire to write that masterpiece.

LEHMAN, H. C. The Creative Years: "Best Books." Sci. Month. 45, 1:65 (July), 1937.

Regional Death Rates—Though this paper concludes that regional mortality studies of tuberculosis, cancer, appendicitis, and typhoid fever are not satisfactorily explicable, the presentation will give sanitarians much food for speculation.

LUMSDEN, L. L., and DAUER, C. C. Geographical Distributions of Mortality from Tuberculosis, Cancer, Appendicitis, and Typhoid Fever in the White Population of the United States. Pub. Health Rep. 52, 25:791 (June 18), 1937.

New York and Mental Health—One out of every 18 persons in New York City may expect to be treated in an institution for mental diseases some time during life, says this author. He doesn't suggest that it is the city life that is responsible, but the rate is considerably lower in up-state New York. Every non-resident will do his own conclusion-jumping.

MALZBERG, B. The Expectancy of Mental Disease in New York City in 1930. Mental Hyg. 21, 2:280 (Apr.), 1937.

Annual Nursing Salary Study—In 1925 the N.O.P.H.N. began its study of salaries paid to public health nurses in the United States and each year since has issued a report. The study is divided into the following items: staff salaries by size of city, type of organization (public or private), size of staff, geographic section of the country; supervisors, assistant directors and directors; and salaries of school nurses. On the whole, salaries seem to be rising. Every executive should find this study of interest.

MILLER, A. J. Salaries of Public Health Nurses in 1937. Pub. Health Nurs. 29, 6:368 (June), 1937.

Cause of Maternal Deaths—What to do about the 4 great impediments to maternal health, poverty, ignorance, unwillingness to bear children, and disease, is discussed briefly and ably.

PARRAN, T., JR. Impediments to Maternal Health. Pub. Health Nurs. 29, 6:347 (June), 1937.

Not Very Healthy, Thank You—Some of the findings of the recent national health inventory are reduced to dramatic statistical charts. Should be read by all as an introduction to the detailed reports to follow.

ROSS, M. How Healthy Are We? Graphic. 26, 7:371 (July), 1937.

Frontier Nursing Service Time Studies—For nurse midwives who serve an isolated, rural area and whose mode of travel is by horse, distribution of time must differ from that of nurses who work in congested urban areas. The Frontier Nursing Service time study shows 26.8 per cent of the time is spent in travel and caring for the horses; 26 per cent goes into midwifery, including prenatal, delivery, and postpartum care; general public health nursing in home and clinic consumes 13.6 per cent; sickness nursing 3.2 per cent; record and office work 16.3 per cent.

WILLEFORD, M. B., and ROSS, M. S. How the Frontier Nurse Spends Her Time. Quart. Bull., Frontier Nursing Service. 12, 4:3 (Spring), 1937.

Insects and Fevers—Reservoirs for the rickettsia infections, originally diseases of insects and now transmitted to man and animals by ticks, mites, lice, and fleas, are shown in world maps. Possible preventive measures are discussed.

ZINSSER, H. The Rickettsia Diseases. Am. J. Hyg. 25, 3:430 (May), 1937.

ASSOCIATION NEWS

SIXTY-SIXTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION

New York, N. Y.
October 5-8, 1937

NEW YORK THE ANNUAL MEETING CITY

THAT New York should become the convention capital of the world is wholly a natural development. The new world lavishly conferred its treasures upon the municipality. It became the metropolis of a mighty nation and, ultimately the most breath-taking city in existence. Through all this magic growth the city remained unspoiled, a neighbor to the cities of the earth, wherefore it was inevitable that New York should grow into a paradise for visitors.

The shade of the venturesome Hendrik Hudson on viewing the rooftops of Manhattan in 1937 would exclaim indignantly, "I don't believe it." Should he slip into the observation tower of Empire State Building, 1,040 feet above the fairyland which is Manhattan by night, a wisp of cloud at his elbow, or should he stroll about the roof of the R. C. A. Building in the Rockefeller Center not far distant, doubtless he would dismiss it all as the fantastic trick of an overwrought imagination. For so it would seem and so it does seem at times to the descendants of Hendrik Hudson. Hudson rode into New York harbor on the quarterdeck of a 90 ton shallop on a voyage of discovery for which he had been paid $320. It was stipulated by his backers on this first Atlantic crossing that his widow would receive an additional $80 in cash should he fail to return. Today his countrymen "commute" to America on superliners beside which the shallop would appear a row boat.

First known as New Amsterdam, New York in 1628 had 270 inhabitants. Within 15 years 18 languages were spoken in the town. In 1653 the municipal government was similar to that of Holland cities. Then, in 1664 the Duke of York sent out an English fleet to capture New Amsterdam and this being done bloodlessly the town was named New York after its captor.

Greater New York of today, the product of unlimited transportation facilities and of the growth of America, covers 320.03 square miles or 201,659 acres as indicated by the Topographical Bureau. As computed by the federal government the incorporated city covers 191,360 land acres as compared with 125,430 acres in Chicago and 81,920 acres in Philadelphia. The visitor gives most of his thought to the Borough of Manhattan which has an area of 21.9 square miles, about one-tenth the size of Chicago.

The City of New York is divided

into five boroughs—Manhattan, Brooklyn, The Bronx, Queens, and Richmond —whose limits are coterminous respectively with the counties of New York, Kings, Bronx, Queens, and Richmond. Each of the boroughs elects a borough president who is in a sense a local mayor. The Borough of Manhattan comprises, along with several small islands adjacent, the Island of Manhattan which lies between the Hudson River on the west and the East River or channel connecting Long Island Sound and New York Bay. Spuyten Duyvil Creek and Harlem River separate Manhattan Island from the mainland on the North and Northeast.

Manhattan, the residential, commercial, and financial center of the metropolis, is 13½ miles long, its maximum width being 2¼ miles at 14th Street. The northern and southern extremities are only a few hundred yards wide. Along the waterfront are 32 miles of dockage facilities available for commercial purposes. Prior to 1847 the city limits did not extend beyond Manhattan.

Upon the solid rock that is largely Manhattan's easy chair, a city has been building whose spires pierce the clouds —when there are any clouds to pierce. Here is a city of countless wonders, a city to which the civilized world has contributed lavishly, and whose attractions are so great that they draw visitors from all points of the compass.

Members of the American Public Health Association and their families and friends will find many things of special interest in and about New York City. At the Civic Center near the City Hall is located the building housing the Departments of Health and Hospitals where Commissioners John L. Rice and S. S. Goldwater have their executive offices.

At Rosebank, Staten Island, is located the Quarantine Station of the U. S. Public Health Service, although within recent months a new arrangement has been put into effect whereby passenger ships having ships' doctors are permitted to proceed to their piers direct if the ship's physician certifies by radio to the government officials that there is no communicable disease on board. Nevertheless, the station is maintained at Rosebank for all other types of ships and is an active branch of the U. S. Public Health Service. Interestingly enough, one of the steamboats which carried the physicians of the Inspection Service is named William H. Welch.

Not far from the headquarters hotel is one of the new District Health Centers located at Ninth Avenue and 27th Street and serving the district known as the Lower West Side. Here will be found a district health officer representing the Commissioner and having under his jurisdiction clinics for tuberculosis, venereal diseases, and eye diseases, as well as prenatal and well baby clinics. Here also will be found branch offices of the Henry Street Visiting Nurse Service, Health Education Services of the Department of Health, and an auditorium for community meetings. Auxiliary to the Health Center is a Medical Advisory Committee made up of physicians in the district and a district health committee made up of local key persons coöperating with the Health Officer in interpreting the work of the Center to the area it serves.

Hospital of special interest to visitors are the Columbia-Presbyterian Medical Center at Broadway and 168th Street. This Center is a combination of the Presbyterian Hospital, the Sloane Hospital for Women, the Vanderbilt Clinic, the Presbyterian Hospital School of Nursing, Columbia University College of Physicians and Surgeons, School of Dental and Oral Surgery, School of Oral Surgery, Babies Hospital, Neurological Institute and

the State Psychiatric Institute and Hospital.

The New York Hospital at York Avenue, 68th Street and East River, includes in its group Cornell University Medical College, Lying-In Hospital, Manhattan Maternity and Dispensary, Nursery and Child's Hospital and Payne Whitney Psychiatric Clinic. Both the Columbia-Presbyterian and New York Hospital groups are easily accessible from the Headquarters Hotel.

NOMINATIONS FOR THE GOVERNING COUNCIL

IN accordance with the By-laws of the Association, the Nominating Committee reports the following nominations for the Governing Council. The Constitution provides that " upon the petition of twenty-five Fellows, the Nominating Committee shall add the name of any Fellow to this list, providing such petition is received fifteen days before the Annual Meeting."

The ten Fellows receiving the highest number of votes on a written ballot cast by the Fellows present and voting at the Annual Meeting in New York City will be elected for the three year term 1937–1940.

M. E. Barnes, M.D., Dr.P.H.
State University of Iowa,
Iowa City, Ia.

Robert E. Chaddock, Ph.D.
Columbia University,
New York, N. Y.

Selwyn D. Collins, Ph.D.
National Institute of Health,
Washington, D. C.

Joel I. Connolly
Board of Health,
Chicago, Ill.

C. M. Derryberry, Ph.D.
U. S. Public Health Service,
Washington, D. C.

Laura A. Draper, R.N.
Community Health Service,
Minneapolis, Minn.

W. F. Draper, M.D.
U. S. Public Health Service,
Washington, D. C.

Gordon M. Fair
Harvard University,
Cambridge, Mass.

A. Grant Fleming, M.D., D.P.H.
McGill University,
Montreal, Que.

Arthur E. Gorman
Department of Public Works,
Chicago, Ill.

Ira V. Hiscock
Yale University,
New Haven, Conn.

Harold J. Knapp, M.D.
Commissioner of Health,
Cleveland, O.

A. J. Lanza, M.D.
Metropolitan Life Insurance Company,
New York, N. Y.

E. V. McCollum
Johns Hopkins University,
Baltimore, Md.

K. F. Meyer, Ph.D., M.D.
University of California,
San Francisco, Calif.

William B. Palmer
Milk Inspection Association of the Oranges and Maplewood,
Orange, N. J.

J. T. Phair, M.B., D.P.H.
Provincial Department of Health,
Toronto, Ont.

Lowell J. Reed, Ph.D.
Johns Hopkins University,
Baltimore, Md.

John L. Rice, M.D.
Commissioner of Health,
New York, N. Y.

George C. Ruhland, M.D.
Health Officer,
Washington, D. C.

William A. Sawyer, M.D.
Eastman Kodak Company,
Rochester, N. Y.

Clarence D. Selby
General Motors Corporation,
Detroit, Mich.

William P. Shepard, M.D.
Metropolitan Life Insurance Company,
San Francisco, Calif.

W. G. Smillie, M.D.
Harvard University,
Boston, Mass.

Raymond V. Stone, D.V.M.
Los Angeles County Health Department,
Los Angeles, Calif.

William D. Stovall, M.D.
State Laboratory of Hygiene,
Madison, Wis.

L. R. Thompson, M.D.
National Institute of Health,
Washington, D. C.

Augustus B. Wadsworth, M.D.
State Department of Health,
Albany, N. Y.

Huntington Williams, M.D.
Commissioner of Health,
Baltimore, Md.

C. C. Young, D.P.H.
State Department of Health Laboratory,
Lansing, Mich.

APPLICANTS FOR FELLOWSHIP

IN accordance with the By-laws of the Association, the names of applicants for Fellowship are officially published herewith. They have requested affiliation with the Sections indicated. Action by the various Section Councils, the Committee on Fellowship and Membership, and the Governing Council will take place between now and the time of the New York City Annual Meeting.

Health Officers Section

Harold D. Chope, M.D., M.P.H., Health Officer, Newton, Mass.
D. C. Y. Moore, M.D., Health Officer, Manchester, Conn.
Benjamin M. Primer, M.D., M.P.H., Director, Amarillo Potter County Health Unit, Amarillo, Tex.
Edwin H. Schorer, M.D., Dr.P.H., Director of Health, Kansas City, Mo.

Laboratory Section

Frederick Eberson, M.D., Ph.D., Epidemiologist, Bureau of Communicable Diseases, Health Department, San Francisco, Calif.
Everett S. Sanderson, Ph.D., M.D., Head, Department of Bacteriology & Public Health, Medical School, University of Georgia, Augusta, Ga.

Vital Statistics Section

James F. Blackerby, Director, Bureau of Vital Statistics, State Department of Health, Louisville, Ky.
Alfred J. Lotka, D.Sc., Assistant Statistician, Metropolitan Life Insurance Company, New York, N. Y.
Hugo Muench, M.D., Dr.P.H., Member, Field Staff, International Health Division, Rockefeller Foundation, New York, N. Y.
William R. Tracey, B.A., Chief of Vital Statistics, Dominion Bureau of Statistics, Ottawa, Ont., Canada

Food and Nutrition Section

Callie Mae W. Coons, Ph.D., Associate Food Economist, Bureau of Home Economics, Washington, D. C.
Robert McD. Allen, M.A., President & Chairman of Board, Vegex, Inc., New York, N. Y.

Child Hygiene Section

J. Warren Bell, M.D., Ph.D., Director, Division of Maternal & Child Health, State Department of Health, Lincoln, Neb.

Public Health Education Section

Norman L. Burnette, Asst. Secretary, Welfare Division, Metropolitan Life Insurance Company, Ottawa, Ont., Canada
G. Hamilton-Francis, M.D., Director of Health Education, Norfolk Public Clinic, Norfolk, Va.
Don C. Lyons, D.D.S., M.S., Editor of Dental Section, Joint Committee on Public Health Education, Jackson, Mich.

Public Health Nursing Section

Katherine E. Faville, M.S., Associate Dean & Professor of Public Health Nursing, School of Nursing, Western Reserve University, Cleveland, O.
Margaret G. Arnstein, C.P.H., R.N., Consultant Nurse, Division of Communicable Diseases, State Department of Health, Albany, N. Y.
Mary D. Forbes, B.S., R.N., Regional Public Health Nursing Consultant, U. S. Public Health Service, New York, N. Y.
Dorothy Deming, A.B., R.N., General Director, National Organization for Public Health Nursing, New York, N. Y.

Epidemiology Section

Samuel Frant, M.D., Epidemiologist & Director, Bureau of Preventable Diseases, Department of Health, New York, N. Y.

Unaffiliated

Edward W. Zukauckas, M.D., Medical Inspector, Department of Health, New York, N. Y.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Walter I. Akana, M.D., Box 63, Westernville, N. Y., Health Officer

George L. Athey, M.D., Beardstown, Ill., District Health Superintendent

Archie M. Baker, M.D., 307 S. Wellwood Ave., Lindenhurst, N. Y., Health Officer

Robert H. Bell, M.D., Carlinville, Ill., District Health Superintendent

Thomas F. Birmingham, M.D., 505 Bondi Bldg., Galesburg, Ill., District Health Superintendent

R. M. Bissekumer, M.D., 404 Rockford Natl. Bank Bldg., Rockford, Ill., District Health Superintendent

Harry H. Blodgett, M.D., 430 Professional Bldg., Beverly Hills, Calif., Health Officer

Walter H. Bruce, M.D., 114 E. Barraque, Pine Bluff, Ark., Director, Jefferson County Health Dept.

Oliver E. Carson, M.D., 2342 State St., Alton, Ill., District Health Superintendent

Elmer E. Clark, M.D., Oakley, Ill., District Health Superintendent

Marguerite E. Eddy, 52 High St., Jamestown, R. I., Heath Officer

Frank J. Fara, M.D., 5539 W. Cermak Rd., Cicero, Ill., District Health Superintendent

Alford G. Hendrick, M.D., Sylvester, Ga., Worth County Health Commissioner

Leon R. Kramer, D.D.S., State Board of Health, Topeka, Kans., Director, Division of Dental Hygiene

Samuel McK. Lougeay, M.D., 7 S. Church St., Belleville, Ill., District Health Superintendent

John B. Mathis, M.D., Ullin, Ill., District Health Superintendent

Joseph F. Mieczynski, M.D., 911–14 St., N. Chicago, Ill., District Health Superintendent

J. W. Montgomery, M.D., Birds, Ill., District Health Superintendent

Paul D. Moore, M.D., Calhoun, Ky., McLean County Health Officer

James J. O'Hearn, M.D., 5422 W. Quincy St., Chicago, Ill., District Health Superintendent

Harry F. Parker, M.D., State Board of Health, Jefferson City, Mo., State Health Commissioner

Stewart G. Patton, M.D., Court House, Youngstown, O., Mahoning County Health Commissioner

Warren F. Pearce, M.D., 209 Illinois State Bank Bldg., Quincy, Ill., District Health Superintendent

John W. Pennock, M.D., 713 E. Genesee St., Syracuse, N. Y., Health Officer Appointee

Roy L. Pierce, M.D., Morrow County District Board of Health, Mt. Gilead, O., Health Commissioner

Frank J. Pokorney, M.D., 2318 S. Austin Blvd., Cicero, Ill., Health Commissioner

Otto R. Scott, M.D., Chrisman, Ill., District Health Superintendent

Walter P. Scott, M.D., 113 Park Place, Lexington, Ill., District Health Superintendent

Martin H. Skagga, M.D., C.P.H., Maple St., Taylorsville, Ky., Director, Spencer County Health Dept.

Regnar M. Sorensen, M.D., Cherokee, Ia., Director, Health District No. 1

Arthur A. Thieda, M.D., 1301 S. 49 Court, Cicero, Ill., Assistant to Health Commissioner

W. Clarence Van Wormer, M.D., 17842 Dixie Highway, Homewood, Ill., District Health Superintendent

Laboratory Section

Floyd W. Brown, Public Health Laboratory, Topeka, Kans., Acting Bacteriologist in charge

Ralph O. Brown, 9 Franklin St., Attleboro, Mass., Milk Inspector and Bacteriologist, Health Dept.

Oliver W. Lohr, M.D., 504 Janes St., Saginaw, Mich., Laboratory Director, Central Laboratory

Vital Statistics Section

Jo C. Rose, State Health Dept., Oklahoma City, Okla., Statistician

Willy Selleslags, 256 Hudson Ave., Albany, N. Y., Student at present; to organize Division of Vital Statistics, State Dept. of Health in Belgium

Ricardo de Shelly, 1617 N. Broadway, Baltimore, Md., Student at present; Chief of

Service of Statistics, Ministry of Health and Social Assistance in Venezuela

Public Health Engineering Section

Walter E. Casey, C.E., Box 477, Dexter, Mo., Public Health Engineer

George O. Hall, Mellon Institute of Industrial Research, Pittsburgh, Pa., Industrial Fellow

Lloyd R. Setter, Ph.D., New York University, University Heights, N. Y., Instructor in Sanitary Engineering

Juan Valenzuela, Aldama 104, Chihuahua, Mexico, President, Junta de Aguas

Industrial Hygiene Section

Lester E. Judd, M.D., Barre City Hospital, Barre, Vt., Division of Industrial Hygiene, State Dept. of Health

John B. Kistler, M.D., 801 Granger Ave., Ann Arbor, Mich., Assistant Medical Supervisor, Bureau of Industrial Hygiene, State Dept. of Health

Henry N. Parrish, City Health Dept., Memphis, Tenn., Industrial Hygiene Engineer

Food and Nutrition Section

William F. Reindollar, Sc.D., State Dept. of Health, Baltimore, Md., Chief, Bureau of Chemistry

Child Hygiene Section

Jack B. Eason, M.D., State Board of Health, Phoenix, Ariz., Director of Maternal and Child Hygiene

Freda E. Miller, Capitol Bldg., Helena, Mont., Executive Secretary, State Orthopedic Commission

Public Health Education Section

Virginia M. Alexander, M.D., 2104 W. Jefferson, Philadelphia, Pa., Student

Ross P. Marsteller, D.V.M., School of Veterinary Medicine, College Station, Tex., Teacher

Loyce I. Williams, 221 Hermitage Court, San Antonio, Tex., Hygiene Worker, Health Sanitary Project

Public Health Nursing Section

Caroline Tillinghast, R.N., Princeton Hotel, Gainesville, Ga., District Advisory Nurse, State Dept. of Public Health

Epidemiology Section

Emmett E. Sappington, M.D., 25 Glover St., San Francisco, Calif., Epidemiologist, Dept. of Public Health

J. Earl Smith, M.D., 2627 N. Kingshighway, St. Louis, Mo., Epidemiologist, Health Division

T. Noxon Toomey, M.D., State Dept. of Public Health, Springfield, Ill., Assistant Epidemiologist

Unaffiliated

Hyman J. Burstein, M.D., 250 N. Water, Decatur, Ill., Venereal Disease Clinician, State Dept. of Public Health

Joseph M. Curry, 550 Main St., Hartford, Conn., Director, Bureau of Inspection, Board of Health

Fred E. Dargatz, M.D., P. O. Box 767, Kinsley, Kans., Milk and Dairy Inspector

Olin E. Hoffman, D.D.S., 1103 Hull Ave., Des Moines, Ia., Dental Consultant, State Dept. of Health

Frank R. Williams, 1605 E. Culver St., Phoenix, Ariz., Educational Adviser, State Board of Health

DECEASED MEMBERS

E. B. Swerdfeger, M.D., Denver, Colo., Elected Member 1928

Harry G. Timbres, M.D., Baltimore, Md., Elected Member 1935

CITY HEALTH CONSERVATION CONTEST FOR 1937 ANNOUNCED

THE Chamber of Commerce of the United States and the American Public Health Association announced on July 1 the ninth annual City Health Conservation Contest. This Contest now announced for 1937 and its partner, the Rural Health Conservation Contest, are considered to be among the most provocative stimuli of recent date in arousing interest in public health and in initiating preventive and protective community health measures. The City Contest for 1937 might have been announced sooner, as was done in the case of the Rural Contest, were it not that the announcement had to be delayed until there was fairly definite assurance that funds would be available for the carrying out of the competition. These funds are provided by insurance companies. Most of the former supporters have already pledged their support for this year, and by the middle of June, 4 new companies had sent contributions to help finance the Contest, being of the opinion that their contribution was an investment, rather than a donation.

With the development of rural full-time health service, a number of the smaller cities formerly in the City Contest, will be included in the Rural Contest as they are part of the county or district health units; but there are still left plenty of cities with their independent health organization to double or triple the number hitherto participating. It is hoped the response to the announcement will be general, as participation has proved most helpful and will still be so to those taking part in the Contest.

ASSOCIATION OF WOMEN IN PUBLIC HEALTH

THE Association of Women in Public Health will hold its customary open meeting on Wednesday evening, October 6, at the McAlpin Hotel with dinner at 6:30.

The meeting of this Association is coming to be looked upon in larger measure each successive year as the one opportunity afforded women in the various fields of public health to meet informally and with no set purpose aside from that of personal acquaintanceship and the friendly exchange of experience.

All women who are present at the American Public Health Association meetings either as members or friends are invited to attend this meeting, at which dinner will be served at a moderate cost.

NEWS FROM THE FIELD

TEN MILLION FOR CANCER RESEARCH

ESTABLISHMENT of a fund understood to be about $10,000,000, to be used for cancer research, was announced by Yale University. The donor of the fund—which will be the Jane Coffin Childs Memorial Fund for Scientific Research—is stated to be Starling W. Childs, of New York.

This contribution is the largest ever made to Yale for scientific research, President Angell said. It is provided in the deed of gift that if, and when, the cancer problem is solved, the foundation is to devote its time to other unsolved medical problems, or, if its governing body so decides, to unsolved problems in other fields of science.

N.O.P.H.N. FORMS FOR REPORTING SCHOOL HEALTH SERVICE

THE May, 1937, issue of *Public Health Nursing* includes an article which will be of particular interest to those responsible for statistical reports of the school health service. A form is presented for the monthly and annual statistical report of this service. Prior to publication the form was submitted to the A.P.H.A. Subcommittee on Manual of Practice, since it is not limited to public health nursing service, but includes items relative to medical and dental services as well.

Comments and suggestions will be welcomed by the Education Committee of the N.O.P.H.N. School Nursing Section which prepared the form.

PUBLIC HEALTH PROGRESS IN SIAM

A NEW regimen of national hygiene is being attempted in Siam under the direction of Dr. Nai Young Huar, Medical Inspector of Public Health. Dr. Huar graduated from the University of Tennessee College of Medicine in 1924 and received a certificate of public health from Harvard School of Public Health in 1933. Dr. Huar is at present conducting a campaign to improve the dietary of the Siamese, urging them to eat a varied diet instead of a diet consisting mostly of rice. Siam has a plentiful supply of proteins and other foods, but because of ignorance and sometimes questionable ideas, the average inhabitant does not eat them. The budget for health service has been increased.—*J.A.M.A.*, May 29, 1937, p. 1900.

PERSONALS

THOMAS PARRAN, M.D.,* President of the A.P.H.A., and Surgeon General of the U. S. Public Health Service, had conferred on him the Honorary Degree of Doctor of Science by Colgate University, Hamilton, N. Y., on June 14.

EDWARD R. BALDWIN, M.D., of Saranac, N. Y., had conferred on him the Honorary Degree of Doctor of Science by Dartmouth College, Hanover, N. H., in recognition of his contribution to the field of tuberculosis.

EUGENE MCGILLIAM, M.D., was appointed Commissioner of Health of the City of Yonkers on June 16, succeeding L. V. WALDRON, M.D., deceased. Dr. McGilliam, who has practised in Yonkers for a number of

* Fellow A.P.H.A.
† Member A.P.H.A.

years, has been interested in the tuberculosis control program and recently completed the course at the DeLamar Institute of Public Health, Columbia University, College of Physicians and Surgeons.

GAYLORD W. ANDERSON, M.D.,* director of the Division of Communicable Diseases of the Massachusetts Department of Public Health, has been appointed Professor and Head of the Department of Preventive Medicine and Public Health at the University of Minnesota.

DR. JOHN B. ELDERS has been appointed Medical Director of Health District No. 12, with headquarters at Paragould, Ark.

DR. MALVERN B. CLOPTON, of Clarksville, Mo., has been appointed for four years on the Missouri State Board of Health.

DR. JULIO RAYMOND SOLTERO, of Lewistown, Mont., has been appointed Health Officer of Fergus County, succeeding DR. JOHN C. DUNN, of Lewistown, who has become head of the state hospital at Warm Springs.

ALVY N. CRAIN, M.D.,* of Phoenix, Ariz., formerly Director of the Maricopa County Health Unit, has been appointed Director of Local Health Administration of the State Department of Health, succeeding GEORGE A. HAYS, M.D.†

DR. CHARLES G. BAKER, of Louisville, Ky., has been appointed Health Officer of Fulton County, to succeed GRADIE R. ROWNTREE, M.D., C.P.H.,† of Hickman, who has been appointed Assistant Health Officer of Louisville.

DR. JAMES C. HANCOCK, recently in the Indian Medical Service at Fort Apache, Ariz., has been made Health Officer of Hickman County, Ky.

JOSEPH J. GERKINS, M.D.,† of Bedford, Ky., has been appointed Health Officer of Fleming County, to succeed CHADWICK W. CHRISTINE, M.D.,† of Flemingsburg, who resigned to accept a similar position in Jefferson County.

DR. PIERCE A. STEELE has been appointed Health Officer of Decatur, Ill., succeeding WILMIER M. TALBERT, M.D.,† resigned.

DWIGHT O'HARA, M.D.,† Professor of Preventive Medicine, Tufts College Medical School, Medford, Mass., has been appointed Vice-Dean, a newly created position, to supervise clinical instruction during the third and fourth years. He will continue as Professor.

RUTHERFORD B. H. GRADWOHL, M.D.,† has resigned as Director of the Laboratory and member of the pathology and bacteriology staffs of the St. Louis County Hospital, St. Louis, Mo. He is succeeded by DR. HOLLIS N. ALLEN.

DR. LON M. TILLMAN, of Kansas City, Mo., has been appointed on the Commission of Nine to Study the Economic, Industrial, Education and Civic Needs of the Negroes of Missouri; he has been assigned to study the health aspect.

ANDREW J. CAUTHEN, M.D.,† of Lake City, S. C., has been appointed Health Officer of Lancaster and Chesterfield Counties.

DR. JOHN M. PRESTON, of Lancaster, S. C., has been appointed head of the Tuberculosis Division of the State Department of Health.

DR. JACK B. EASON, of Yuma, Ariz., has been placed in charge of the State Bureau of Maternal and Child Health.

DR. EUGENE L. WALSH, of Hawkeye, Iowa, has been appointed in charge of the Washington County Public Health Unit, succeeding DR. REGNAR M. SORENSON, of Washington, Iowa.

* Fellow A.P.H.A.
† Member A.P.H.A.

DR. THOMAS B. MAGATH,† of the Mayo Clinic, has been appointed Health Officer of the City of Rochester, Minn. He succeeds DR. CHARLES H. MAYO,† who has been Health Officer for 25 years.

FRANK W. LAIDLAW, M.D.,* of Middletown, N. Y., has been appointed District Health Director on the staff of the New York State Department of Health.

DR. MILTON W. WILLIAMSON, of Redboiling Springs, Tenn., recently associated with the Kentucky State Board of Health and formerly with the U. S. Public Health Service, has been named Associate City Health Director of Chattanooga, Tenn.

DR. MALCOLM H. MERRILL, in charge of the syphilis clinic at the University of California Hospital, San Francisco, Calif., has been appointed Chief of the Bureau of Venereal Diseases of the California State Department of Public Health.

DR. WILLIAM ARTHUR SMITH, of San Antonio, Tex., has been appointed Director of Mental Hygiene in the Texas State Department of Health.

DR. CLYDE W. BESON, of Claremore, Okla., former State Health Commissioner, has been appointed Medical Adviser to the State Industrial Commission.

DR. HERBERT R. KOBES, of Augusta, Me., has been placed in charge of the maternal and child health program now being carried out by the Maine State Department of Health with Social Security Funds.

DR. FERGUS O. MAHONY, of El Dorado, Ark., was elected President of the State Board of Health, succeeding DR. WILLIAM G. HODGES, of Malvern.

DR. EDWARD S. SMITH, of Kirksville, Mo., was elected President of the State Board of Health, succeeding DR. TIMOTHY S. BOURKE, of Kansas City.

H. R. Ross, M.D.,† Director of the Division of Child Hygiene in the Kansas State Board of Health, has been appointed acting secretary to succeed EARLE G. BROWN, M.D.,* resigned.

RAGNAR T. WESTMAN, M.D.,† formerly of the Division of Public Health, Minneapolis, and a member of the Educational Staff of the University of Minnesota, has been appointed Director of the newly organized County Health Unit in Bay County, Michigan, effective May 15.

R. C. REHDER, M.D., who has been Assistant Health Officer in Richland County, Ohio, has become County Health Officer, succeeding MILLARD C. HANSON, M.D.,† who is going to Toledo to become City Health Officer there.

GEORGE MCLEAN LAWSON, M.D., DR.P.H.,† Professor of Public Health and Bacteriology at the University of Louisville, School of Medicine, has been appointed to the chair of Preventive Medicine and Bacteriology in the Medical Department of the University of Virginia, Charlottesville, Va.

ROBERT M. BARDIN, M.D.,† of Rutherfordton, N. C., recently Health Officer of Rutherford County, has been appointed Health Officer of Richmond County, to succeed DR. B. B. DALTON,† of Rockingham.

DR. EDMUND G. ZIMMERER, Lincoln, Nebr., has been appointed Assistant Epidemiologist in the State Department of Health to head a division of venereal disease.

DR. BENJAMIN M. BERGER, formerly City Health Officer of Phoenix, Ariz., has been appointed Superintendent of the State Hospital for the Insane at Phoenix, succeeding DR. JAMES R. MOORE.

* Fellow A.P.H.A.
† Member A.P.H.A.

DR. FRANCIS DE SALVO has been named Health Officer of Niagara, Mich., for two years.

DR. HARRISON EILERS, of Los Lunas, N. M., has been appointed Health Officer of the Eighth District, with headquarters in Los Lunas, succeeding JULIAN O. LONG, M.D.,† of Albuquerque, who went to the Third District in Albuquerque.

JOHN D. DONOHUE, M.D., has been appointed Health Officer of Montville, Conn., to fill the vacancy caused by the death of MORTON E. FOX, M.D.

JOSEPH MAGNANO, M.D., has been appointed Health Officer of Haddam, Conn., to fill the unexpired term of J. E. WALDMAN, M.D.

DR. PEYTON M. CHICHESTER, of Clarendon, Va., Secretary of the Arlington County Board of Health, has been appointed Assistant Director of the Bureau.

DR. WILLIAMSON C. WELBURN, of Arlington, Va., has been appointed Health Officer of Arlington County, to succeed DR. PEYTON M. CHICHESTER, of Clarendon.

DR. WILLIAM A. MITCHELL, of Colfax, Wash., has been appointed Health Officer of Whitman County, Wash., to succeed DR. ROBERT J. SKAIFE.

DR. RUFUS F. PAYNE, of Lebanon, Tenn., has been appointed Health Officer of Tift County, Ga.; he formerly served in a similar capacity in Walker County.

DR. THOMAS C. WATSON, Benton. Ark., has been appointed medical director of the Tenth District, comprising Saline, Hot Springs and Grant counties.

DR. FRANK L. QUILLMAN, formerly of Winter Garden, Fla., has been appointed Health Officer of Orange County, with offices in Orlando.

DR. EOLINE B. CHURCH DUBOIS, Springfield, Mass., has been appointed permanent medical inspector for the local school department.

DR. EDWIN F. DAILY has been named Director of the Division of Maternal and Child Health of the Children's Bureau, Washington, D. C., to succeed ALBERT MCCOWN, M.D.†

DR. JOHN A. SEVIER, of Colorado Springs, Colo., has been elected President of the Colorado Tuberculosis Association.

DEATH

HARRISON PRESCOTT EDDY,* Boston Engineer, and partner in the firm of Metcalf & Eddy which he founded in 1907, died in Montreal on June 15. He was attending the meeting of the Engineering Institute of Canada and was to have been awarded an honorary membership within a few hours. He was 67 years of age.

Mr. Eddy was a specialist in sanitary engineering and consulting engineer to some 75 municipalities on problems of sewage disposal and water supply, and to manufacturers on the treatment and disposal of industrial waste.

He was a member of the Boston Society of Civil Engineers, of which he was president in 1914; of the American Institute of Consulting Engineers, of which he was vice-president in 1926; of the American Water Works Association, the American Public Health Association, the American Chemical Society, the Union and Engineers clubs of Boston, the Engineering Institute of Canada, the Institution of Civil Engineers of London, and the Engineers Club of New York.

Mr. Eddy has been a member of the A.P.H.A. since 1910, and a Fellow since 1924.

* Fellow A.P.H.A.
† Member A.P.H.A.

CONFERENCES AND DATES

American Association of School Physicians. Annual Meeting in conjunction with Annual Meeting of the American Public Health Association. Hotel Pennsylvania, New York, N. Y. October 5–8.

American College of Surgeons. Chicago, Ill. October 25–29.

American Dietetic Association—Twentieth Annual Meeting. John Marshall Hotel, Richmond, Va. October 18–21.

American Hospital Association. Atlantic City, N. J. September 13–17.

American Public Health Association —Sixty-sixth Annual Meeting. New York, N. Y. October 5–8.

American Society of Sanitary Engineers. Washington, D. C. September 7–10.

Association of Dairy, Food and Drug Officials of the United States. Raleigh Hotel, Washington, D. C. October 26–29.

Fifth International Congress of Radiology. Chicago, Ill. Sept. 13–17.

International Association of Milk Dealers. Dallas, Tex. Oct. 21–23.

International Association of Milk Sanitarians. Brown Hotel, Louisville, Ky. October 11–13.

Michigan Public Health Association. Lansing, Mich. November 10–12.

National Association of Educational Broadcasters. Urbana, Ill. September 13–14.

New England Milk Producers Association. Boston, Mass. October 26–27.

New England Sewage Works Association. Worcester, Mass. October 1–2.

New England Water Works Association. Poland Springs, Me., September 21–24.

New York State Association of Dairy and Milk Inspectors. Hotel Utica, Utica, N. Y. September 22–24.

New York State Conference on Social Work. New York, N. Y. October 19–22.

New York State Health and Physical Education Association. Syracuse, N. Y. December, 1937.

Ohio Conference of Sewage Operators. Cincinnati, Ohio. October 19–20.

Ontario Hospital Association. Toronto, Ont. October 21–23.

Pacific Coast Accident Prevention Conference. San Francisco, Calif. September.

Pennsylvania State Organization for Public Health Nursing. Altoona, Pa. October 28.

Rocky Mountain Sewage Works Association. Santa Fe, N. M. September 20–22.

Southern Medical Association. New Orleans, La. November 28.

FOREIGN

International Physiological Congress. Zurich, Switzerland. August 14–18.

World Congress of Universal Documentation. Paris. August 16–21.

International Union Against Tuberculosis. Lisbon, Portugal. September 5–9.

Fourth International Pediatric Congress. Rome, Italy. September 24–30.

Second International Congress for the Protection of Infancy. Rome, Italy. October 4–8.

Congress of Physiologists. Paris. October 11–13.

Institute of Sewage Purification. London. November 19.

Hawaii Territorial Medical Association. Honolulu, T. H. May, 1938.

Gifts and Bequests

The American Public Health Association is the technical society of professional public health workers. It is not endowed. It derives its income from membership fees, its publications and business services, and from grants for special purposes.

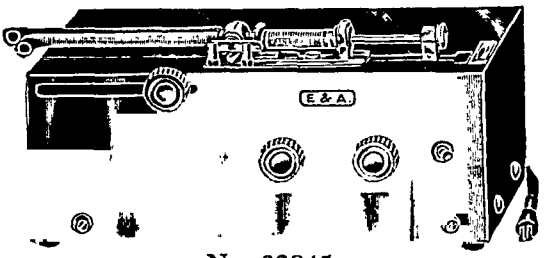
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North Outfall Sewer Inspection, City of Los Angeles.

Symposium on Mechanical Equipment
Pumps, Bearings, Clarifiers and Plant Layout.

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Automatic Control of Skimmers, Sludge Pumps, Gas Engines and Waste Gas.

Mechanical Filtration of Effluents.

Trickling Filter Operation Results at Worcester, Mass.

Wastes Disposal as Related to Shellfish.

Progress in Controlling Pollution of Rhode Island Waters.

Industrial Wastes and Their Effects on Municipal Sewage Treatment Plants.

Standard Methods of Sewage Analysis.

Trickling Filters.

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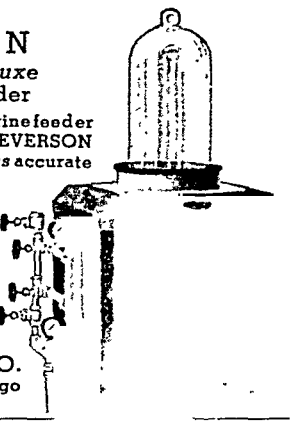
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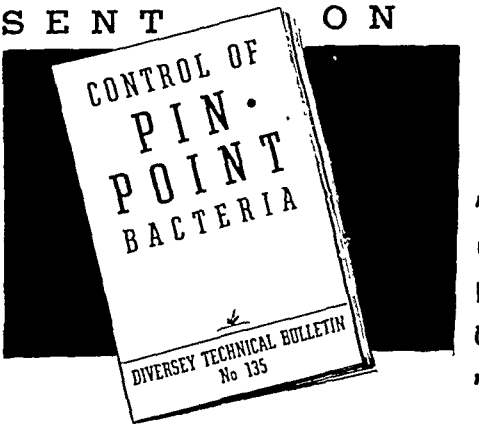
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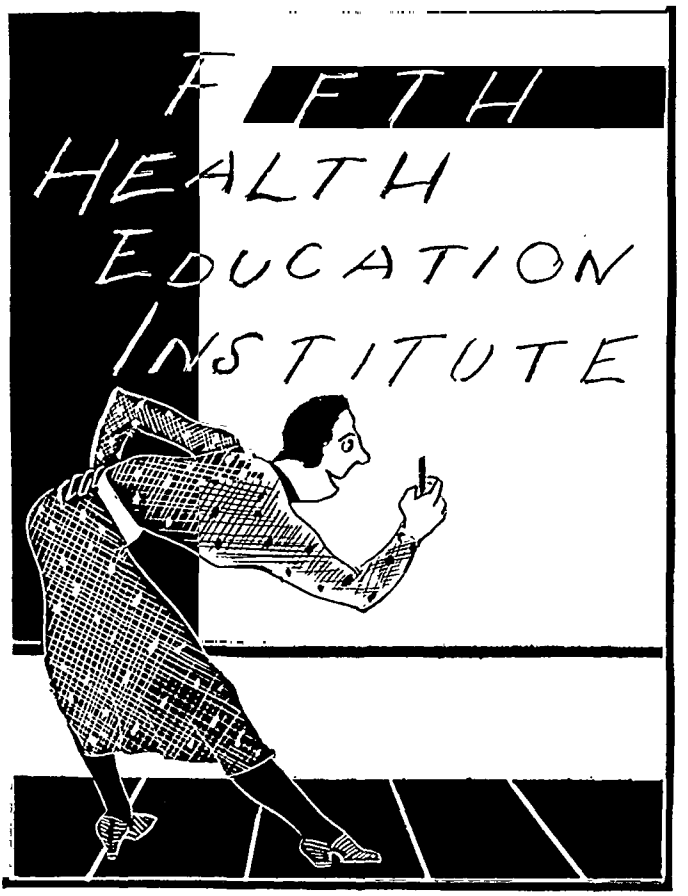
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L. R. KUHN, *Editor*
27 Ricketts Laboratory University of Chicago Chicago, Ill.

Positions Wanted

HEALTH OFFICERS

Young man, S.B. in biology and public health; Massachusetts Institute of Technology, post-graduate course in health education, business administration and economics; desires executive position with official or non-official agency. Has been health officer of a city of 10,000 population for 9 years. A-296

Physician, M.D. Ohio State University; C.P.H. Harvard School of Public Health, seeks position as health officer or epidemiologist. A-297

Physician, M.D. Syracuse University; M.P.H. Harvard School of Public Health, postgraduate studies in bacteriology and immunology, will consider position as health officer or epidemiologist. Has served as director of a county health unit, CCC camp and district surgeon, medical and sanitary advisor in public health and epidemiologic problems and venereal disease field survey officer. A-305

STATISTICIAN

Young man with 8 years' experience in public health statistics in well known national organization and degree in Business Administration, now employed, will consider statistical position or combination with office administration. S-310

LABORATORY

Young man, A.B. in Chemistry, Phillips University; M.S. in Public Health Laboratory Work, University of Michigan, desires position in state or city health department laboratory. L-304

Man with M.S. Major in Bacteriology and Biochemistry, desires position with university health department or hospital as bacteriologist. Five years' experience as research assistant and instructor in bacteriology and serology in a Class A medical school. L-306

Gentleman, Ph.D., University of Southern California; special courses at Pasteur Institute, Paris, wishes position as director of a laboratory, in research work or in field investigation. Has had wide experience as instructor in bacteriology in a State University, director of a state hygienic laboratory, director of several hospital laboratories, and research assistant, department of bacteriology in a large Western university. L-315

CHILD HYGIENE

Woman physician, M.D. Creighton Medical School, with extensive experience in maternal, infant and child hygiene, and special interest in crippled children's service, desires position in field work. C-301

MISCELLANEOUS

Young woman, M.S.P.H. University of Michigan, experienced in laboratory research and health education, is available for research or investigative work. M-303

Physician, M.D. Northwestern University; Ph.D. Johns Hopkins University; Dr.P.H. Yale University, is eager to secure general public health work, health center administration, infant welfare or epidemiology position. A-300

Young physician, M.D. University of Michigan, wishes position as epidemiologist, preferably in field and clinical work in syphilis control. M-307

Woman, Ph.D., with broad experience and excellent background, desires position doing socio-medical research. M-308

Physician with post-graduate studies in public health at University of Michigan, seeks employment in public health field. Has served as Acting Assistant Surgeon, U.S.P.H.S., part-time county health officer and assistant director of a state health department division of maternal and child health. M-309.

Young man, M.S.P.H. in Health Council Administration, University of Michigan, desires position as a health council executive. Has taught high school science and biology and has been employed by a tuberculosis and public health association. M-313

Young man, C.P.H. Massachusetts Institute of Technology; preclinical studies at Rochester Medical School, wishes position in public health administration, public health education or industrial hygiene. Has done research at M.I.T. in health education, and has served as Observer of several health education projects in an Eastern state. Holds permanent health officer's license from the State of New Jersey. M-314

Positions Available

HEALTH OFFICER—Ohio County, 100,000 population. Required: M.D. Grade A School; satisfactory internship; certificate in public health or equivalent preferred; county public health experience. Salary $5,000. Address applications to PA-1, American Public Health Association, 50 West 50th Street, New York, N. Y.

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PRELIMINARY PROGRAM

SIXTY-SIXTH ANNUAL MEETING

American Public Health Association

NEW YORK, OCTOBER 5-8, 1937

THE AMERICAN PUBLIC HEALTH ASSOCIATION
50 West 50th Street New York, N. Y.

PRELIMINARY PROGRAM OF THE SIXTY-SIXTH ANNUAL MEETING AMERICAN PUBLIC HEALTH ASSOCIATION

NEW YORK, N. Y., OCTOBER 5–8, 1937

THE Annual Meeting Program Committee presents the Preliminary Program of the scientific sessions of the Sixty-Sixth Annual Meeting of the American Public Health Association and information concerning meetings of related organizations.

This program is incomplete and perhaps inaccurate in some respects. The affiliations of speakers have been omitted, but will be published in full in the Final Program. Delegates are urged to consult the Final Program, available at the Registration Desk in the Pennsylvania Hotel at the time of the meeting.

Tuesday, 9:30 A.M.

HEALTH OFFICERS

First Session—Banquet Room, Pennsylvania Hotel

THE HEALTH DEPARTMENT IN THE FIELD OF MEDICINE

From the Standpoint of a Health Official. JOHN L. RICE, M.D.

From the Standpoint of a Private Practitioner. FLOYD S. WINSLOW, M.D.

Discussion. JOHN A. FERRELL, M.D., DR.P.H., and ROBERT H. RILEY, M.D.

VITAL STATISTICS

First Session—Parlor 1, Pennsylvania Hotel

The Physician's Statement of Cause of Death. A. HARDISTY SELLERS, M.D., D.P.H.

The Adaptation of the International List of Causes of Death to the Changing Needs of the Medical Profession and Public Health Groups. HALBERT L. DUNN, M.D., PH.D.

What Should Be Taught to Students in Medical Schools in Regard to Vital Statistics. THOMAS J. LEBLANC, SC.D.

Report on "Underreporting by Physicians." (Sub-Committee of the Committee to Study Death Certification.) HUGO MUENCH, JR., M.D., DR.P.H.

Report on "Effects of Changing Form of Certificate." (Sub-Committee of the Committee to Study Death Certification.) *Chairman*, THOMAS J. DUFFIELD.

Tuesday, 9:30 A.M.

INDUSTRIAL HYGIENE

First Session—Parlor 2, Pennsylvania Hotel

SYMPOSIUM ON HEAVY METALS

Precision Methods for the Evaluation of the Toxic Metals. LAWRENCE T. FAIRHALL, PH.D.

Mercury Poisoning from the Public Health Viewpoint. PAUL A. NEAL, M.D.

Lead Absorption, Lead Excretion and Lead Poisoning. ROBERT A. KEHOE, M.D.

Personal Protective Devices for Preventing Exposure to Heavy Metal Dusts and Fumes. WILLIAM P. YANT.

MENTAL HYGIENE

Special Session—North Ball Room, New Yorker Hotel

Presiding: HAVEN EMERSON, M.D.

Mental Hygiene and the Health Department. ALLEN W. FREEMAN, M.D.

Is There an Epidemiology of Mental Disease? HENRY B. ELKIND, M.D.

An Experiment in Training Nurses to Help Mothers in Preventive Mental Hygiene. JULIUS LEVY, M.D.

Subject and speaker to be announced.

PUBLIC HEALTH ENGINEERING SECTION AND CONFERENCE OF STATE SANITARY ENGINEERS

Joint Session—Salle Moderne, Pennsylvania Hotel

Presiding: H. J. DARCEY, *Chairman,* Conference of State Sanitary Engineers.

Proposed Standards for Design and Sanitation of Bathing Places. (Report of the Joint Committee on Bathing Places.) *Chairman,* WARREN J. SCOTT.

Meeting Flood Emergencies More Effectively — Selected Experiences of 1937 as a Guide for the Future.

a. Availability and Coördination of Federal Facilities to Expedite Emergency Sanitation Measures. RALPH E. TARBETT.
b. The Essentials of an Effective State Plan and Program of Activities for Flood Sanitation. C. W. KLASSEN and ARTHUR P. MILLER, C.E.

Discussion. JOHN K. HOSKINS, C.E., and F. CLARKE DUGAN, C.E.

Progress Report of the Joint Committee on Summer Camps and Roadside Places. *Chairman,* CARL E. GREEN. (*To be presented in abstract.*)

Report of the Joint Committee on Milk Supply. *Chairman,* WALTER VON D. TIEDEMAN, M.C.E.

Announcements.

Tuesday, 9:30 A.M.

LABORATORY

First Session—South East Ball Room, Pennsylvania Hotel

Address of the Chairman. WILLIAM D. STOVALL, M.D.

Section Business.

PUBLIC HEALTH NURSES

First Session—Winter Garden, McAlpin Hotel

Section Business.

Reports of Committees.

CHILD HYGIENE

First Session—Roof Garden, Pennsylvania Hotel

Some Observations on the Use of Tests for Vitamin A Deficiencies. CARROLL E. PALMER, M.D., PH.D.

Heart Disease in Childhood. T. DUCKETT JONES, M.D.

Tuberculosis Among Children in Cattaraugus County, New York. J. H. KORNS, M.D.

State-wide Program of Oral Health. HOWARD B. METTEL, M.D., and MARY H. WESTFALL, D.D.S.

Tuesday, 12:30 P.M.

INDUSTRIAL HYGIENE

Luncheon Session—Green Room, McAlpin Hotel

PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY

Pioneers' Luncheon—Governor Ball Room, Governor Clinton Hotel

Tuesday, 2:30 P.M.

FOOD AND NUTRITION

First Session—Parlor 1, Pennsylvania Hotel

Presiding: WALTER S. FRISBIE

Report of the Committee on Milk and Dairy Products. Ice Cream. *Chairman,* F. W. FABIAN, PH.D.

Special Health Values of the Soy Bean. J. H. KELLOGG, M.D.

Critical Evaluation of the Formal Titration Method for the Examination of Cream. MILTON E. PARKER.

Quality and Public Health Factors in Cream. J. A. KEENAN, PH.D.

The Present Status of the Vitamins in Milk. E. V. MCCOLLUM, PH.D.

Report of the Committee on Standard Methods of Vitamin D Bioassay of Milk. *Chairman,* HENRY T. SCOTT, PH.D.

Tuesday, 2:30 P.M.

PUBLIC HEALTH ENGINEERING

First Session—South East Ball Room, Pennsylvania Hotel

Rat Control Through the Medium of Rat Proofing. B. E. HOLSENDORF.

The Survival of E. Typhi in Sewage Treatment Processes. CARL E. GREEN.

Progress Report of the Committee on Waterways Pollution. *Chairman*, LOUIS F. WARRICK, CH.E. (*To be presented by title only.*)

Progress Report of the Committee on Shellfish. *Chairman*, L. M. FISHER, D.P.H. (*To be presented by title only.*)

Chloramine Disinfection of Salt Water Swimming Pools. LEWIS V. CARPENTER and LLOYD R. SETTER.

Discussion. ATTMORE E. GRIFFIN, PH.B.

Report of the Committee on Water Supply. *Chairman*, ARTHUR E. GORMAN.

LABORATORY

Second Session—North Ball Room, New Yorker Hotel

CANCER

The Development of Laboratory Service in the Control of Cancer. AUGUSTUS B. WADSWORTH, M.D.

The Training of Pathologists. F. W. HARTMAN, M.D.

Attempted Correlation Between a Few Intracellular Chemical Compounds and the Biology of Growth and Development. STANLEY P. REIMANN, M.D.

Subject and speaker to be announced.

Trends in Cancer Research. CLARENCE C. LITTLE, SC.D.

PUBLIC HEALTH EDUCATION

First Session—Ball Room, New Yorker Hotel

Health Education Exhibits. (Report of the Committee on Section Exhibits.) *Chairman*, EVART G. ROUTZAHN.

Evaluation of Public Health Education Methods. (Report of the Committee on Evaluation.) *Chairman*, BERTRAND BROWN.

PANEL DISCUSSION

Why Health Education? Panel Leader, W. FRANK WALKER, DR.P.H.

Panel Members:
C. M. DERRYBERRY, PH.D.
GEORGE T. PALMER, DR.P.H.
FRANK KIERNAN
BENJAMIN C. GRUENBERG, PH.D.
RAYMOND S. PATTERSON, PH.D.
EDWARD P. EHRICH

Tuesday, 2:30 P.M.

EPIDEMIOLOGY

First Session—Salle Moderne, Pennsylvania Hotel

Ten-Year Experience with 3-Dose Diphtheria Toxoid in Ontario. A. L. McKAY, M.D., and REGINALD P. HARDMAN, M.D., D.P.H.

Familial Aggregation of Infectious Disease. WADE H. FROST, M.D.

An Epidemic of Type I Pneumococcus Pneumonia at the Worcester State Hospital. WILSON G. SMILLIE, M.D., G. HAROLD WARNOCK, M.D., and HAROLD J. WHITE.

Necropsy Evidences on Relation of Smoky Atmosphere to Pneumonia. SAMUEL R. HAYTHORN, M.D., and HARRY B. MELLER.

NEWER RESPONSIBILITIES IN PUBLIC HEALTH ADMINISTRATION

Special Session—Roof Garden, Pennsylvania Hotel

The Control of Syphilis. GEORGE H. RAMSEY, M.D.

The Control of Cancer. HENRY D. CHADWICK, M.D.

Diabetes. CHARLES F. BOLDUAN, M.D.

Heart Disease. Speaker to be announced.

CHILD HYGIENE SECTION AND PUBLIC HEALTH NURSES

Joint Session—Banquet Room, Pennsylvania Hotel

Pregnancy Wastage. REGINA K. STIX, M.D., and DOROTHY G. WIEHL.

Stillbirths. ETHEL C. DUNHAM, M.D., EDWIN F. DAILY, M.D., CLARA E. HAYES, M.D., and ELIZABETH C. TANDY, D.Sc.

Maternity Care in Rural Areas by Public Health Nurses. HELEN A. BIGELOW, R.N.

Discussion.

THE AMERICAN ASSOCIATION OF STATE REGISTRATION EXECUTIVES

First Session—Winter Garden, McAlpin Hotel

History of the Association. W. J. V. DEACON, M.D.

Report on the Use of Special Stillbirth Forms. WALTER A. PLECKER, M.D.

Reports of Committees.

Business.

Tuesday, 6:30 P.M.

PUBLIC HEALTH EDUCATION

Buffet Supper—Roof Garden, Pennsylvania Hotel

Informal meeting without business, for members of the Section and Their Friends.

There will be a display of posters which are to be considered at the Clinic on Posters in the Friday session.

Tuesday, 8:00 P.M.

FIRST GENERAL SESSION

Auditorium, Manhattan Opera House

Invocation.

Addresses of Welcome.

Address. LIVINGSTON FARRAND, M.D.

Announcement of the Sedgwick Memorial Medal Award.

Reception to the President and the President-elect.

Dancing.

Wednesday, 9:30 A.M.

VITAL STATISTICS

Second Session—Salle Moderne, Pennsylvania Hotel

Report of the Committee on Accident Statistics. *Chairman,* ROBERT J. VANE.

Report of the Committee on Forms and Methods of Statistical Practice. *Chairman,* A. W. HEDRICH, Sc.D.

Report of the Committee to Study Death Certification. *Chairman,* MARJORIE T. BELLOWS.

Report of the Committee on Residence Allocation. *Chairman,* A. W. HEDRICH, Sc.D.

Registrars and Registrars. FRANCIS D. RHOADS.

The Homicide Situation in the United States. RICHARD N. WHITFIELD, M.D.

Section Business.

CHILD HYGIENE

Second Session—South East Ball Room, Pennsylvania Hotel

Mental Hygiene. Speaker to be selected.

Some Suggestions for a More Effective School Health Program. JOHN T. PHAIR, M.B., D.P.H.

Post-Graduate Education of Physicians in Obstetrics and Pediatrics. MYRON E. WEGMAN, M.D., and EDWIN F. DAILY, M.D.

Section Business.

Wednesday, 9:30 A.M.

LABORATORY

Third Session—Parlor 1, Pennsylvania Hotel

WATER AND SEWAGE

LABORATORY

Fourth Session—Parlor 2, Pennsylvania Hotel

Section Business.

Drinking Glass and Washwater Examination. ROSE L. EPNER.

Poliomyelitis. MAURICE BRODIE, M.D.

Subject to be submitted. MAJOR WESLEY C. COX, M.D.

Blood Chemistry. ELDON M. BOYD, M.D.

EPIDEMIOLOGY

Second Session—Roof Garden, Pennsylvania Hotel

Members of the Health Officers Section are invited to attend

Milk-Borne Streptococcus Infections. ERNEST L. STEBBINS, M.D., and HOLLIS S. INGRAHAM, M.D.

The Present Status of Scarlet Fever Prevention. GAYLORD W. ANDERSON, M.D.

Experiences in Scarlet Fever Control. EDWARD R. KRUMBIEGEL, M.D.

Scarlet Fever Immunization. EDWIN H. PLACE, M.D., and GEORGE P. SANBORN, M.D.

The Prophylactic Use of Convalescent Serum in Scarlet Fever. MAURICE HARDGROVE, M.D.

INDUSTRIAL HYGIENE SECTION, PUBLIC HEALTH NURSES, AND NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS

Joint Session—Banquet Room, Pennsylvania Hotel

SYPHILIS CONTROL IN INDUSTRY AND INDUSTRIAL DERMATOSES

Presiding: LEVERETT D. BRISTOL, M.D., DR.P.H.

Syphilis Control in Industry. R. R. SAYERS, M.D.

The Role of the Public Health Nurse in Syphilis Control. GLADYS CRAIN.

The Diagnosis of Industrial Skin Diseases. LOUIS SCHWARTZ, M.D.

The Role of Allergy in Industrial Dermatoses. MARION SULZBERGER, M.D.

Syphilis of the Eye as a Factor in Industry. Speaker to be announced.

Wednesday, 12:30 P.M.

FOOD AND NUTRITION

Luncheon Session—Salle Moderne, Pennsylvania Hotel

PUBLIC HEALTH NURSES

Luncheon Session—Governor Ball Room, Governor Clinton Hotel

Report on the National Organization of Public Health Nursing Study of Personnel Practices for Public Health Nurses in Official Agencies. MARIAN G. RANDALL.

PUBLIC HEALTH EDUCATION

Luncheon Session—Ball Room, McAlpin Hotel

Public Relations for Public Health. Speaker to be announced.

BUSINESS ASPECTS OF THE HEALTH DEPARTMENT

Luncheon Session—Green Room, McAlpin Hotel

DELTA OMEGA

Luncheon Session—Winter Garden, McAlpin Hotel

Wednesday, 2:30 P.M.

LABORATORY

Fifth Session—South East Ball Room, Pennsylvania Hotel

VIRUS DISEASES

Virus Diseases and Their Importance and the Public Health. WILBUR A. SAWYER, M.D.

Production and Use of Smallpox Vaccine Virus Cultivated in the Chorioallantoic Membrane of Chick Embryos. G. JOHN BUDDINGH, M.D.

Experiments on Antirabic Vaccination with Tissue Culture Virus. LESLIE T. WEBSTER, M.D.

Lymphocyctic Chorio-meningitis. THOMAS M. RIVERS, M.D.

Influenza. THOMAS FRANCIS, JR., M.D.

Discussion. HANS ZINSSER, M.D., Sc.D.

LABORATORY AND FOOD AND NUTRITION SECTIONS

Joint Session—Parlor 1, Pennsylvania Hotel

DAIRY AND FOOD PRODUCTS

Presiding: ROBERT S. BREED, PH.D.

Wednesday, 2:30 P.M.

PUBLIC HEALTH ENGINEERING

Second Session—North Ball Room, New Yorker Hotel

Sanitary Aspects of Air Conditioning. CONSTANTIN P. YAGLOU.

Sanitary Ventilation. WILLIAM F. WELLS.

Summary of Studies of Air Bacteria with Particular Reference to Streptococci in New York Schools, Subways, Cars, Streets, and a Park. LEON BUCHBINDER, PH.D.

Report of the Joint Committee on Plumbing. *Chairman,* JOEL I. CONNOLLY.

Progress Report of the Committee on Industrial Sanitation. *Chairman,* CHARLES L. POOL. (*To be presented by title only.*)

Present Status of the Phosphatase Test for Pasteurized Milk. WALTER VON D. TIEDEMAN, M.C.E.

Discussion. PAUL F. KRUEGER.

Section Business.

PUBLIC HEALTH EDUCATION

Second Session—Banquet Room, Pennsylvania Hotel

Section Business.

Results of Mass Education for Tuberculosis Prevention in Detroit. HENRY F. VAUGHAN, DR.P.H.

Visual Education for Schools. PAULINE B. WILLIAMSON.

New Program of the National Education Association. EDNA W. BAILEY, PH.D.

Progress in School Health Education. (Report from the Seventh Biennial Health Section, World Federation of Education Associations' Conference, Tokyo, Japan.) Secretary, SALLY LUCAS JEAN.

The Health Education Institute. (Report of the Committee on Health Education Institute.) *Chairman,* IRA V. HISCOCK.

Relations with Child Hygiene Section. (Report of the Committee on Relations with the Child Hygiene Section.) *Chairman,* CLAIR E. TURNER, DR.P.H.

FOOD AND NUTRITION

Second Session—Salle Moderne, Pennsylvania Hotel

Presiding: WALTER S. FRISBIE

Report of the Committee on Foods. *Chairman,* ALBERT C. HUNTER, PH.D.

Food Allergy from the Medical Viewpoint. Speaker to be announced.

Food Allergy from the Chemical Viewpoint. HENRY STEVENS, PH.D.

The Federal Food and Drugs Act and its Health Aspects. WILLIAM G. CAMPBELL.

Sanitation and Quality Control in the Fishery Industries. GERALD A. FITZGERALD.

Present Status of the Spray Residue Problem. Speaker to be announced.

Wednesday, 2:30 P.M.

PUBLIC HEALTH ADVANCING

Special Session—Roof Garden, Pennsylvania Hotel

Historical Developments from 1860 to 1872, Preceding the Establishment of the American Public Health Association. PROFESSOR RICHARD H. SHRYOCK.

International Coöperation in Hygiene. FRANK G. BOUDREAU, M.D.

Recent Advances in the Field of Public Health Nursing. ELIZABETH G. FOX, R.N.

Subject and speaker to be announced.

THE AMERICAN ASSOCIATION OF STATE REGISTRATION EXECUTIVES

Second Session—Parlor 2, Pennsylvania Hotel

Revision of Birth, Death and Stillbirth Certificates. W. FRANK WALKER, DR.P.H.

Discussion by Representatives of the U. S. Children's Bureau, the U. S. Census Bureau, the U. S. Public Health Service, Insurance Companies, and Members in General.

Wednesday, 6:30 P.M.

VITAL STATISTICS

Dinner Session—Winter Garden, McAlpin Hotel

Plans for Special Studies During 1940 Census Period. Official and non-official agencies.

Presiding: S. A. STOUFFER, PH.D.

PUBLIC HEALTH ENGINEERING AND CONFERENCE OF STATE SANITARY ENGINEERS

Annual Engineers' Stag Dinner—Roof Garden, Pennsylvania Hotel

WILLIAM J. ORCHARD, *Toastmaster.*

ASSOCIATION OF WOMEN IN PUBLIC HEALTH

Dinner Session—Ball Room, McAlpin Hotel

Thursday, 9:30 A.M.

PUBLIC HEALTH ENGINEERING

Third Session—Winter Garden, McAlpin Hotel

SYMPOSIUM ON SANITARY INSPECTION ACTIVITIES AND PROBLEMS

Oyster Control Measures from a Public Health Standpoint. MILTON H. BIDWELL.

Problems in Elimination of Sub-Standard Housing. DENNIS E. DUFFY.

The Control of Nuisances. EDWARD WRIGHT.

Supervision of Fumigation and Extermination. JOHN OBERWAGER, M.D.

Supervision of Food in New York City. ABRAHAM LICHTERMAN, PHAR.D.

Thursday, 9:30 A.M.

HEALTH OFFICERS

Second Session—Auditorium, Manhattan Opera House

WHAT EVERY HEALTH OFFICER SHOULD KNOW

TEN MINUTE TALKS BY REPRESENTATIVES OF OTHER SECTIONS ON DEVELOPMENTS IN THEIR SPECIAL FIELDS

Laboratory Section. WILLIAM D. STOVALL, M.D.

Vital Statistics Section. L. W. HUTCHCROFT.

Public Health Engineering Section. Representative to be announced.

Industrial Hygiene Section. LEVERETT D. BRISTOL, M.D., DR.P.H.

Food and Nutrition Section. FRED W. TANNER, PH.D.

Child Hygiene Section. Representative to be announced.

Public Health Education Section. MARY P. CONNOLLY.

Public Health Nursing Section. Representative to be announced.

Epidemiology Section. Representative to be announced.

Section Business.

LABORATORY

Sixth Session—North Ball Room, New Yorker Hotel

TUBERCULOSIS

Laboratory Methods for the Diagnosis of Early Tuberculosis. MAZYCK P. RAVENEL, M.D.

Laboratory Test for Tuberculosis in Animals. C. R. SCHROEDER, D.V.M.

The Accurate Standardization of Diluted Tuberculin. WILLIAM E. BUNNEY, PH.D.

A Comparative Study of the Various Culture Media for the Primary Isolation of Tubercle Bacilli. A. L. MACNABB, D.V.M.

Title and speaker to be announced.

CHILD HYGIENE SECTION AND PUBLIC HEALTH NURSES

Joint Session—Roof Garden, Pennsylvania Hotel

THE CRIPPLED CHILD

Development of the Federal Program for the Care of Crippled Children. ROBERT C. HOOD, M.D.

Preventive Aspects of Crippling Diseases. H. E. HILLEBOE, M.D.

The Public Health Nurse and Orthopedic Nursing Care. DOROTHY J. CARTER, R.N.

Social Work and the Handicapped Child. DOROTHY BUCKNER.

Education of the Handicapped Child. BRONSON CROTHERS, M.D.

Thursday, 9:30 A.M.

FOOD AND NUTRITION

Third Session—Parlor 2, Pennsylvania Hotel

Presiding: WALTER S. FRISBIE

Report of the Committee on Microbiological Methods of Food Examination. *Chairman,* LAWRENCE H. JAMES, PH.D.

Diet and Resistance to Infection and the Effect of the Maternal Diet. CHARLES F. CHURCH, M.D.

What Do We Know About Nutritional Dental Caries? BION R. EAST, D.D.S.

Nutritional Influence on Teeth. FRANCES KRASNOW, PH.D.

Chemical Literature Suggesting the Extent of Incipient Vitamin Deficiency in the United States. (Report of the Committee on Nutritional Problems.) *Chairman,* D. BREESE JONES, PH.D.

Organization and Activity in Nutrition in the Ministry of Public Health of Uruguay. JUSTO F. GONZALEZ, M.D.

INDUSTRIAL HYGIENE

Second Session—Parlor 1, Pennsylvania Hotel

Address of the Chairman. Vaccines Against the Common Cold — Are They of Value in the Industrial Health Program? LEVERETT D. BRISTOL, M.D., DR.P.H.

The Lung Findings in Foundry Workers — A Four-Year Survey. O. A. SANDER, M.D.

The Development of an Industrial Hygiene Program in a State Health Department. HERMAN F. EASOM, M.D., and M. F. TRICE.

Diagnosing and Curing the Accident Habit. CHARLES S. SLOCOMBE.

Discussion.

Four Years' Experience with the Industrial Hygiene Appraisal Form. E. L. SIMONDS and E. R. DEJON.

VITAL STATISTICS SECTION AND THE AMERICAN ASSOCIATION OF STATE REGISTRATION EXECUTIVES

Joint Session—Ball Room, McAlpin Hotel

Presiding: J. F. BLACKERBY.

Vital Statistics from a Legal Viewpoint. JOHN S. STRAHORN, JR., LL.B., S.J.D.

What Is a Delayed Certificate and Under What Conditions and Requirements Should It Be Filed? FRANKLIN H. REEDER, JR., M.D.

What Social Security Needs Will Be from State Bureaus of Vital Statistics. EWAN CLAGUE, PH.D.

Accuracy of Cancer Death Records. ELEANOR J. MACDONALD.

Thursday, 9:30 A.M.

PUBLIC HEALTH ENGINEERING AND EPIDEMIOLOGY SECTIONS

Joint Session—Banquet Room, Pennsylvania Hotel

SYMPOSIUM ON EXPLOSIVE OUTBREAKS OF GASTROINTESTINAL DISORDERS WITH PARTICULAR REFERENCE TO TRANSMISSION BY WATER SUPPLIES AND METHODS OF STUDY AND PREVENTION

Presiding: GORDON M. FAIR, and CLARENCE L. SCAMMAN, M.D.

Apparent Prevalence and Engineernig Aspects of Such Outbreaks. JACK J. HINMAN, JR.

Discussion. ANSELMO F. DAPPERT.

Gastrointestinal Disturbances of Obscure Origin. ALBERT V. HARDY, M.D.

Discussion. MILTON V. VELDEE, M.D.

Study of a Water-borne Outbreak of Gastrointestinal Disorders in a Tennessee Town. W. CARTER WILLIAMS, M.D., CRIT PHARRIS, M.D., and FRANCIS W. KITTRELL.

Epidemiological and Laboratory Studies of an Outbreak of Gastrointestinal Disorder Not Proved to be Water-borne. D. GORDON GILL, M.B., D.P.H., JAMES G. MCALPINE, PH.D.

Discussion. CHARLES D. BOWDOIN, M.D.

Thursday, 12:30 P.M.

PUBLIC HEALTH EDUCATION

Luncheon Session—South East Ball Room, Pennsylvania Hotel

The Box-Office Appeal of Health Movies. Speaker to be announced.

PROFESSIONAL EDUCATION

Special Luncheon—Salle Moderne, Pennsylvania Hotel

Presiding: W. S. LEATHERS, M.D., *Chairman of the Committee.*

Certain Criteria in the Qualifications and Preparation of Health Officers. HENRY E. MELENEY, M.D.

Preparing the Nurse to Meet Community Needs in Public Health. MARION G. HOWELL, R.N.

Thursday, 4:30 P.M.

NATIONAL ORGANIZATION FOR PUBLIC HEALTH NURSING, COURSE DIRECTORS

Parlor 1, Pennsylvania Hotel

Thursday, 7:00 P.M.

SECOND GENERAL SESSION

Banquet—Roof Garden, Pennsylvania Hotel

Address of the President-elect. ARTHUR T. MCCORMACK, M.D.

Presentation of Certificate to G. Everett Hill.

Announcement of Health Conservation Contest Awards.

Dancing.

Friday, 9:30 A.M.

HEALTH OFFICERS

Third Session—South East Ball Room, Pennsylvania Hotel

Politics in the Selection of Municipal Health Department Personnel, Is There a Remedy? WILLIAM PARR CAPES.

The Qualifications of a Venereal Disease Control Officer. THOMAS B. TURNER, M.D.

Is the Routine Examination and Certification of Food Handlers Worthwhile? WILLIAM H. BEST, M.D.

Health Implications in Disasters. WILLIAM DEKLEINE, M.D.

PUBLIC HEALTH EDUCATION

Third Session—Banquet Room, Pennsylvania Hotel

Section Objectives. (Report of the Committee on Objectives.) *Chairman,* IAGO GALDSTON, M.D.

Publications for Health Education. (Report of the Committee on Publications.) *Chairman,* CARL A. WILZBACH, M.D.

Window Displays for Health Education. POLLY PETTIT.

Clinic on Printed Matter.
Critic on Content — LEON WHIPPLE.
Clinic on Posters.
Clinic Leader — AUBYN CHINN.

EPIDEMIOLOGY

Third Session—Winter Garden, McAlpin Hotel

Measles. FRANKLIN H. TOP, M.D.

The Epidemiology of Trichinosis. CLARENCE D. BARRETT, M.D., and RICHARD SEARS, M.D.

Epidemic Diarrhea of the New-Born: Epidemiologic Features of Highly Fatal Diarrhea Among New-Born Infants in Hospital Nurseries. SAMUEL FRANT, M.D., and HAROLD ABRAMSON, M.D.

The Investigation of Early Syphilis. WILLIAM T. CLARK, M.D., and CLEALAND A. SARGENT, M.D.

Friday, 9:30 A.M.

LABORATORY

Seventh Session—Salle Moderne, Pennsylvania Hotel

Typhus as a Causal Factor in Thrombo-angiitis Obliterans. CHARLES GOODMAN, M.D.

Difficulties Encountered in Pneumococcal Type Determination. ANNABEL W. WALTER.

A Simple Revised Technic of Actinic Sunshine Analysis with Modifications for Freezing Weather and Near Meridian Exposures. FRED O. TONNEY, M.D.

The Cultivation of H. ducreyi and the Use of Bacillary Antigen for Intracutaneous Tests in the Recognition of Chancroidal Infection. EVERETT S. SANDERSON, PH.D., and R. W. GREENBLATT, M.D.

HYGIENE OF HOUSING

Special Session—North Ball Room, New Yorker Hotel

Air Conditioning. C.-E. A. WINSLOW, DR.P.H., *Chairman,* Committee on Hygiene of Housing.

Housing Survey. ROLLO H. BRITTEN.

Plumbing. JOEL I. CONNOLLY.

Sociology. PROFESSOR F. STUART CHAPIN.

Construction Methods. ROBERT L. DAVISON.

Town Planning. PROFESSOR JAMES FORD.

Architecture. J. ANDRE FOUILHOUX.

Home Economics. PROFESSOR GRETA GRAY.

Public Housing. H. A. GRAY.

Lighting. JAMES E. IVES, PH.D.

Home Safety. DR. M. G. LLOYD.

Sanitary Engineering. HAROLD A. WHITTAKER.

VITAL STATISTICS SECTION AND BIOMETRIC SECTION, AMERICAN STATISTICAL ASSOCIATION

Joint Session—Ball Room, McAlpin Hotel

Presiding: LOWELL J. REED, PH.D.

Some Effects on Our Vital Statistics of an Individual Check of Registration Against a Census Record. LOWELL J. REED, PH.D.

Problems of the Next Census. LEON E. TRUESDELL, PH.D.

Determining Population in Intercensal Years by Means of Continuous Population Registers. DOROTHY S. THOMAS.

Methods of Estimating Postcensal Populations. HENRY S. SHRYOCK.

Friday, 9:30 A.M.

FOOD AND NUTRITION AND CHILD HYGIENE SECTIONS, AND PUBLIC HEALTH NURSES

Joint Session—Auditorium, Manhattan Opera House

Presiding: BERNARD E. PROCTOR, PH.D., and AMOS L. PEAGHLER, M.D.

Nutrition Program in a State Health Department. WOODBRIDGE E. MORRIS, M.D.

Nutrition in Maternal and Child Health Programs under the Social Security Act. MARJORIE M. HESSELTINE.

Nutritional Education in the Home. The Dutchess Couny, New York, Project. BERTRAND E. ROBERTS, M.D.

The Nutritionist in the City Public Health Program. SOPHIA S. HALSTED.

Education in Nutrition by Private Agencies. JAMES A. TOBEY, DR.P.H.

Discussion. HENRY C. SHERMAN, PH.D.

PUBLIC HEALTH ENGINEERING SECTION AND FEDERATION OF SEWAGE WORKS ASSOCIATIONS

Joint Session—Roof Garden, Pennsylvania Hotel

Presiding: CHARLES A. EMERSON, JR., *Chairman,* Federation of Sewage Works Associations.

The Effects of Industrial Wastes on Sewage Treatment. ALMON L. FALES.

Discussion. ARTHUR D. WESTON.

A Survey of Recent Developments in the Treatment of Industrial Wastes. WILLEM RUDOLFS, PH.D.

Discussion. CHARLES R. HOOVER, PH.D.

The Practical Methods of Preventing Dairy Waste Nuisances. H. A. TREBLER, CH.E., ENG.D.

Discussion. CHARLES C. AGAR.

The Value of Sewage Sludge as a Fertilizer. (Report of the Committee on Sewage Disposal.) *Chairman,* LANDON PEARSE.

Friday, 12:30 P.M.

DIPHTHERIA IMMUNIZATION

Special Luncheon—Governor Ball Room, Governor Clinton Hotel

Preliminary Report of the Diphtheria Immunization Committee.
DONALD T. FRASER, M.B., D.P.H.
WILLIAM E. BUNNEY, PH.D.
EDWARD S. GODFREY, JR., M.D.
WILLIAM T. HARRISON, M.D.
G. FOARD MCGINNES, M.D.
WILLIAM H. PARK, M.D.
V. K. VOLK, M.D.

Friday, 12:30 P.M.

NATIONAL COMMITTEE OF HEALTH COUNCIL EXECUTIVES

Parlor B, Hotel Pennsylvania

Friday, 2:30 P.M.

PUBLIC MEETING

Special Session—Auditorium, Manhattan Opera House.

Presiding: ARTHUR T. MCCORMACK, M.D.

The Social Significance of the Health Center. HOMER FOLKS.

Individual Preventive Medicine. IAGO GALDSTON, M.D.

Subject and speaker to be announced.

Subject and speaker to be announced.

CHILD HYGIENE SECTION, PUBLIC HEALTH NURSES, AND AMERICAN ASSOCIATION OF SCHOOL PHYSICIANS

Joint Session—Banquet Room, Pennsylvania Hotel

Practical Procedures in School Health Service. DOROTHY B. NYSWANDER, PH.D.

Discussion. AMELIA GRANT, R.N.

The Extent of Seasonal Variation of Intermittency in Growth. CLAIR E. TURNER, DR.P.H.

Health Knowledge of School Children with Reference to Health Education. MAX SEHAM, M.D.

Discussion.

THE AMERICAN ASSOCIATION OF STATE REGISTRATION EXECUTIVES

Third Session—Parlor 1, Pennsylvania Hotel

Round Table.

Why Declining Birth Rates? IRVA C. PLUMMER.

Interstate Recognition of Transit Permits. A. W. HEDRICH, SC.D.

How Best Compute Stillbirth and Maternal Death Rates? L. W. HUCHCROFT.

How Can the U. S. Census Bureau Extend Aid to States in Promoting Completeness and Accuracy of Registration? ROBERT L. MCLAREN.

Office Organization to Conserve Time of Director. HARRIET I. PARKHURST.

LABORATORY

Eighth Session—South East Ball Room, Pennsylvania Hotel

VETERINARY PHASES OF PUBLIC HEALTH

MEETINGS OF OTHER ORGANIZATIONS

AMERICAN ASSOCIATION OF SCHOOL PHYSICIANS

Friday, 2:30 P.M. Joint Session with Child Hygiene Section and Public Health Nurses. *Banquet Room, Pennsylvania Hotel.* (See page 18.)

ASSOCIATION OF WOMEN IN PUBLIC HEALTH

Wednesday, 6:30 P. M. Dinner. *Ball Room, McAlpin Hotel.*

THE AMERICAN ASSOCIATION OF STATE REGISTRATION EXECUTIVES

Tuesday, 2:30 P.M. Winter Garden, McAlpin Hotel. (See page 6.)

Wednesday, 2:30 P.M. Colonial Room, McAlpin Hotel. (See page 11.)

Thursday, 9:30 A.M. Joint Session with Vital Statistics Section. *Ball Room, McAlpin Hotel.* (See page 13.)

Friday, 2:30 P.M. Winter Garden, McAlpin Hotel. (See page 18.)

BIOMETRIC SECTION, AMERICAN STATISTICAL ASSOCIATION

Friday, 9:30 A.M. Joint Session with Vital Statistics Section. *Ball Room, McAlpin Hotel.* (See page 16.)

BUSINESS ASPECTS OF THE HEALTH DEPARTMENT

Wednesday, 12:30 P.M. Luncheon. *Green Room, McAlpin Hotel.*

CONFERENCE OF STATE SANITARY ENGINEERS

Tuesday, 9:30 A.M. Joint Session with Public Health Engineering Section. *Salle Moderne, Pennsylvania Hotel.* (See page 3.)

Wednesday, 6:30 P.M. Annual Engineers' Stag Dinner. *Roof Garden, Pennsylvania Hotel.* (See page 11.)

DELTA OMEGA

Wednesday, 12:30 P.M. Luncheon. *Winter Garden, McAlpin Hotel.*

FEDERATION OF SEWAGE WORKS ASSOCIATIONS

Friday, 9:30 A.M. Joint Session with Public Health Engineering Section. *Roof Garden, Pennsylvania Hotel.* (See page 17.)

NATIONAL ORGANIZATION FOR PUBLIC HEALTH NURSES, COURSE DIRECTORS

Thursday, 4:30 P.M. Parlor 1, Pennsylvania Hotel.

NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS

Wednesday, 9:30 A.M. Joint Session with Industrial Hygiene Section and Public Health Nurses. *Banquet Room, Pennsylvania Hotel.* (See page 8.)

PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY

Tuesday, 12:30 P.M. Pioneers' Luncheon—*Governor Ball Room, Governor Clinton Hotel.*

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Oxidation is the principal factor operating in the destruction of vitamin C. The rate of oxidation depends—among other things—upon temperature, degree of exposure to oxygen, and presence of substances which catalyze the oxidation reaction. Chief among the catalysts is the enzyme known as ascorbic acid oxidase. This enzyme is instrumental in the loss of physiologically active forms of cevitamic acid (ascorbic acid) by catalyzing the transformation of this latter substance into dehydrocevitamic acid (dehydroascorbic acid), which is more readily decomposed by a nonenzymic reaction into a compound having no antiscorbutic activity. This enzyme is apparently widely distributed in the vegetable kingdom, having been found in cabbage, carrots, lima beans, parsnips, peas, pumpkin, spinach, squash, string beans, sweet corn and swiss chard. Fortunately, the cevitamic acid oxidase is completely inactivated by heating to 100°C. for one minute (2).

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(1) 1936, Food Research, 1, 1

(2) 1936, J. Biol. Chem., 116, 717

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American Journal of Public Health

And *The Nation's Health*

Volume 27 — September, 1937 — Number 9

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1 ROBINSON, F. H. and STROUD, GEORGE M.: Jour. Amer. Med. Assn., Vol. 108, No. 14, April 3, 1937, page 1170.

2 LAUGHLEN, G. F.: Canad. Med. Assn. Jour., Vol. 33, page 179, 1935.

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American Journal of Public Health
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Official Monthly Publication of the American Public Health Association

Volume 27 — September, 1937 — Number 9

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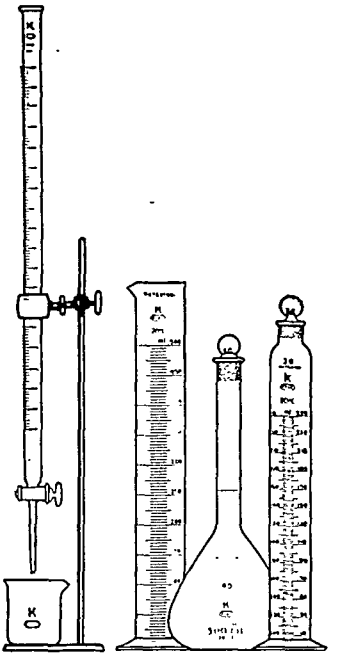
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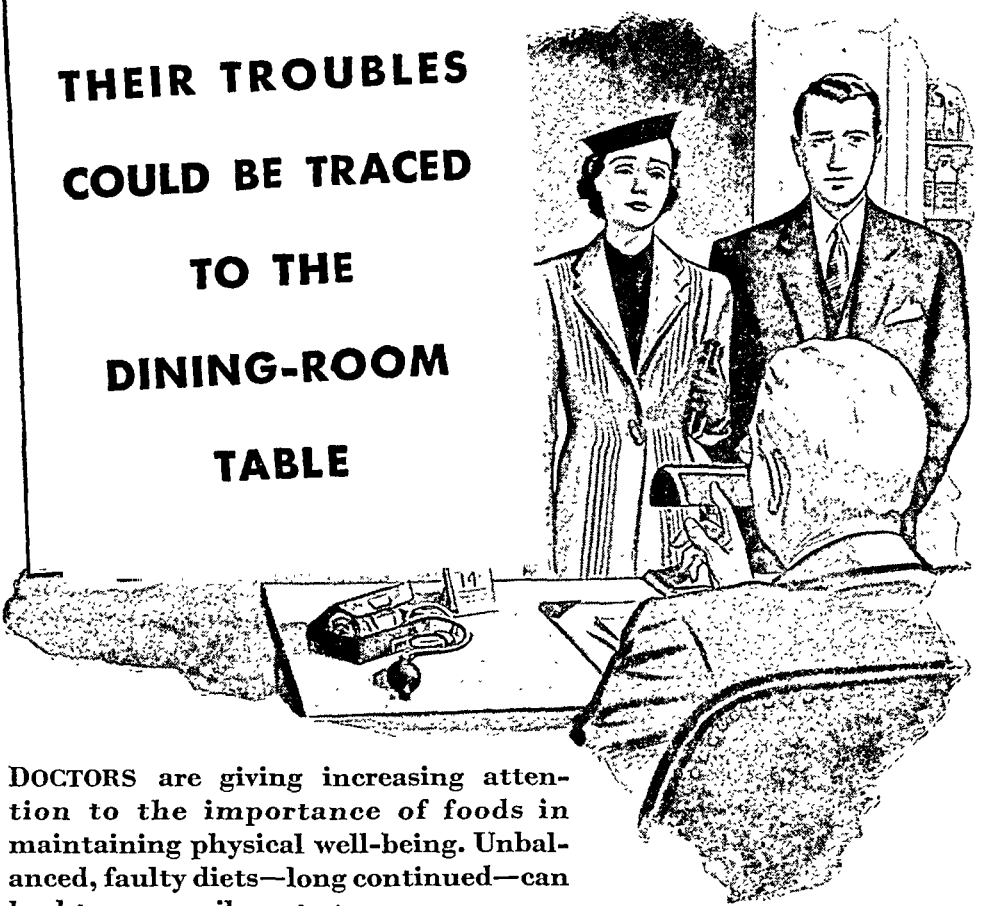
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GEORGIA PUBLIC HEALTH ASSOCIATION M. E. Winchester, M.D., Commissioner of Health, Brunswick.	Atlanta, May 1938
MASSACHUSETTS PUBLIC HEALTH ASSOCIATION G. Donald Buckner, 69 Coolidge Avenue, Needham.	Boston, Jan. 27, 1938
MICHIGAN PUBLIC HEALTH ASSOCIATION Marjorie Delavan, State Department of Health, Lansing.	Lansing, Nov. 10–12
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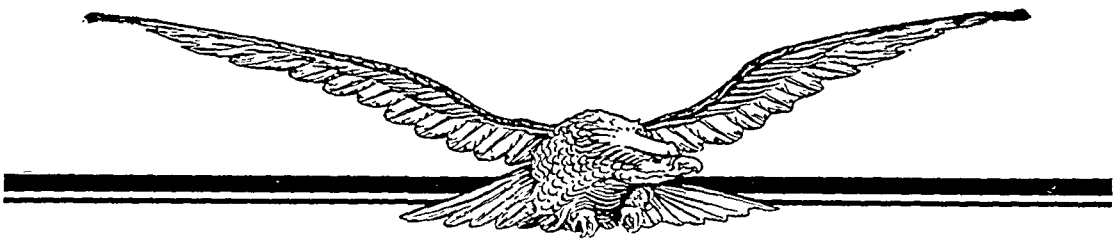
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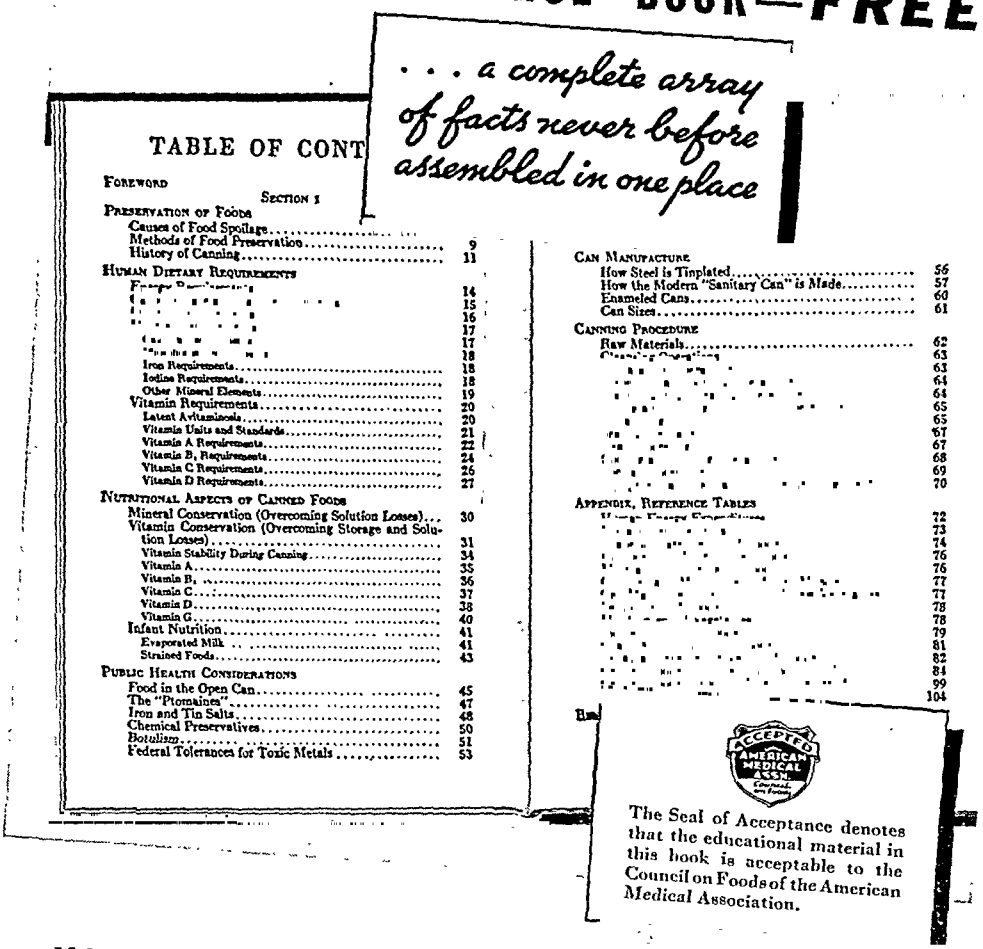


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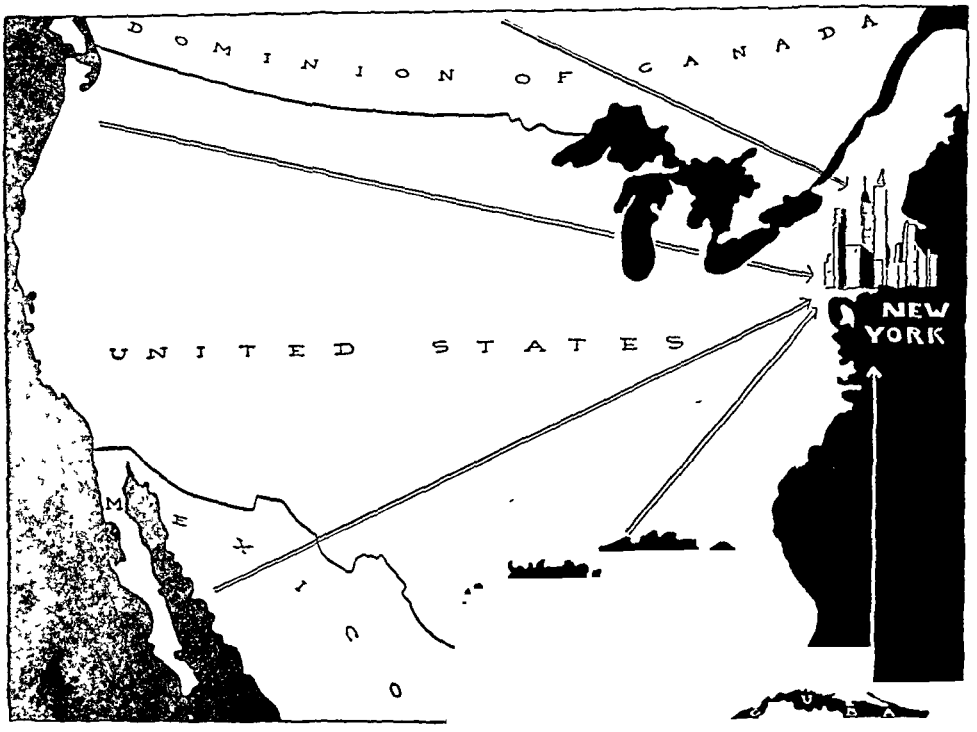
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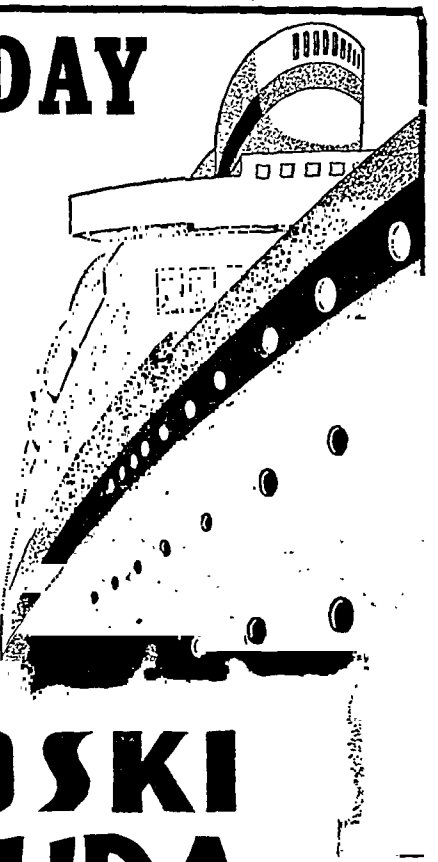
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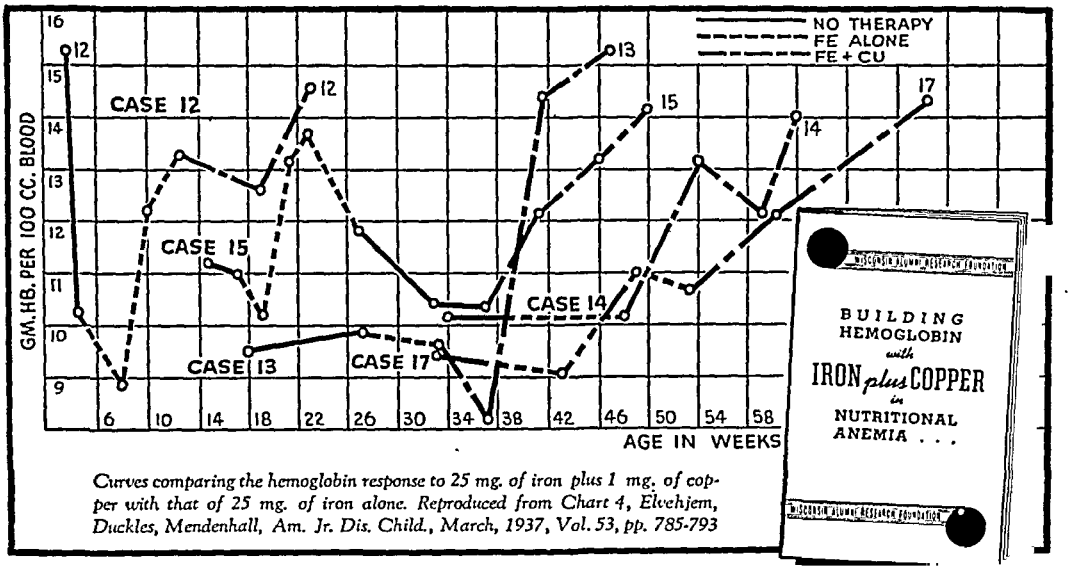
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Curves comparing the hemoglobin response to 25 mg. of iron plus 1 mg. of copper with that of 25 mg. of iron alone. Reproduced from Chart 4, Elvehjem, Duckles, Mendenhall, Am. Jr. Dis. Child., March, 1937, Vol. 53, pp. 785-793

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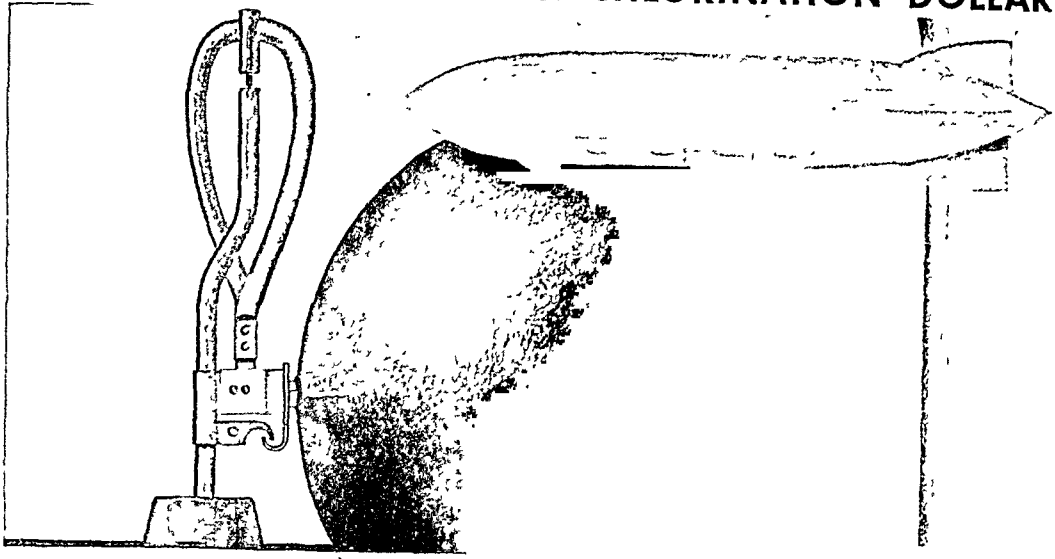
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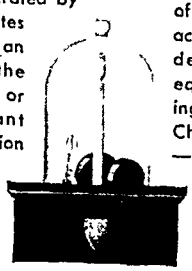
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An Automatically Controlled Dishwashing Machine*

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DISHWASHING machines have been in use in this country for approximately 40 years. Although the machines have been mechanically improved and utensils are now washed more quickly, more economically, and with less breakage than can be accomplished by hand, the sanitary efficiency of the entire process is dependent upon the machine operator, who is most often a transient, unskilled laborer.

The essential steps in washing or processing of cooking and eating utensils are: (1) the removal of all soil by washing for the optimum length of time at the optimum temperature, with water to which a suitable detergent has been added in proper concentration, and (2) the removal of any bacteria which may remain by rinsing with clear water, also for the optimum time at the optimum temperature.

The present-day dishwashing machines are equipped with either steam heated or gas heated wash tanks. The rinse water may be heated in the machine by steam or gas, or may be supplied direct to the machine from the house hot water line or from a separate hot water heater. The operator controls the temperature of the wash water and, in certain types of machines, the temperature of the rinse water also. The temperature of the wash water may also be influenced by the pressure of the steam or gas used as the heating agent. The temperature of the rinse water is subject to variations from the same causes.

In the fall of 1935, the Commanding General, the Army Medical Center, directed that a study of mechanical dishwashing and dishwashing machines be made. The 20 machines in use at this station, operated by a constantly changing personnel, afforded an excellent field for study. It was soon seen that the solution of the problem lay in the development of a dishwashing machine in which the temperature of the wash water, the length of time of the wash process, and the temperature and length of time of the rinse process must be automatically and not manually controlled.

* From the Laboratory Service, Walter Reed General Hospital, Army Medical Center, Washington, D. C.

In association with the Chairman of the Sub-Committee on Standard Methods for the Examination of Dishwashing Devices of the Committee on Research and Standards of the A.P.H.A., Major A. P. Hitchens, M.C., U.S.A., the author placed his plans for an automatically controlled dishwashing machine before representatives of a large manufacturer.* The coöperation of this company was whole-heartedly extended and their engineers developed an experimental machine which was installed in Mess I, Walter Reed General Hospital, for research and study under varying conditions of operation.

The machine installed is a standard, single tank, stock model, with automatic thermostatic control on the steam injector to the wash tank, to which accessory equipment for automatic control of the washing process has been added. Figure I is a perspective drawing of the functioning parts. The accessory equipment includes an electric thermostat installed in the wash tank, a magnetic motor switch, an operating switch, installed on the wash handle, a time relay, a solenoid, an interlock rod, a pilot light, a wash water temperature gauge and a rinse water temperature gauge. Most of these accessory parts are standard commercial items which have been employed successfully in various types of automatic temperature control.

When operating the machine, the wash process cannot be activated unless the water in the wash tank has reached the predetermined temperature for which the temperature controls are set. Coincident with the starting of the wash process, the doors of the machine lock and cannot be opened until the time cycle for the wash process is completed. If, during the wash process cycle, the wash water drops below the predetermined temperature, the machine will stop automatically.

The automatic thermostatic control on the steam injector to the wash tank and the electric thermostat on the wash tank may be set at any desired temperature between the range 120° F. and 190° F. Once set, it is possible to seal these thermostats, thus preventing unauthorized adjustment. The length of the time cycle controlling the wash period may also be varied. This control may also be sealed. Flexible control of the wash process makes the machine readily adaptable for operation under the various sanitary regulations. As a result of studies in the processing of eating utensils in messes at the Army Medical Center, the standard of a 60 second wash period at 160° F. has been adopted as regulation and the controls of the machine set in accordance with this regulation.

The temperature of the rinse water and the time of the rinse process on this machine are manually and not automatically controlled. Automatic time and temperature controls for the rinse process have been developed and a machine equipped with these additional controls will be installed at the Army Medical Center shortly.

Less mechanical skill is required in the operation of this machine than is necessary in the operation of a standard model. During the past 8 months, the machine has been successfully operated by a number of unskilled mess attendants in the routine daily processing of the cooking and eating utensils of a large mess, and exhaustive experimental studies have been made without mechanical breakdown or the development of mechanical flaws.

The machine is operated in the following manner:

The wash tank is filled with water, the initial charge of washing powder is added, and the thermostatically controlled steam in-

* This machine was developed by the Hobart Manufacturing Company, Troy, Ohio, and was installed for test and experimental study at the Army Medical Center with the permission of the Surgeon General, U. S. Army.

jector (A. Figure I) is opened. When the water in the wash tank has reached the predetermined temperature at which the machine is to be operated (the wash tank temperature

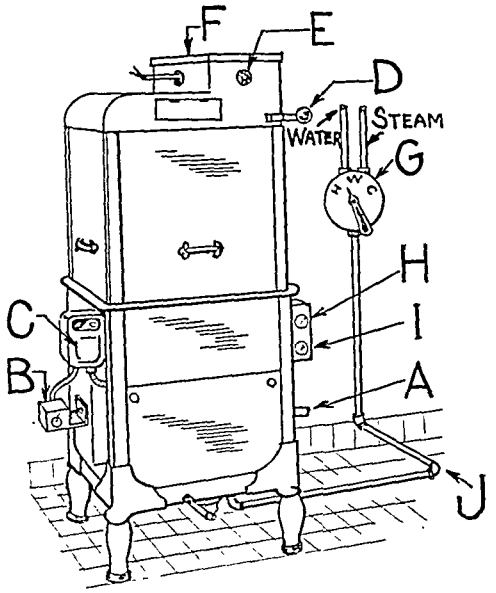


FIGURE I—PERSPECTIVE DRAWING OF MACHINE

A. Steam injector with automatic thermostatic control.
B. Open contact thermostat to wash tank.
C. Magnetic motor switch.
D. Wash and rinse control handle.
E. Control box, containing time cycle control, operating switch and solenoid.
F. Pilot light.
G. Regulating valve.
H. Rinse water temperature gauge.
I. Wash water temperature gauge.
J. Rinse line to machine.

is indicated constantly on the wash tank temperature gauge, I. Figure I), the operator places a rack of utensils in the machine, closes the doors, and starts the motor by pressing the "push button" on the magnetic starting switch (C. Figure I) which is controlled by the electric thermostat (B. Figure I) to the wash tank. The contacts on this thermostat remain constantly open, until the wash water reaches the predetermined temperature, when they close and permit the current to pass and energize the magnetic switch. (If the water in the wash tank drops below the predetermined temperature the contacts on the thermostat open, the magnetic starting switch is deënergized and the machine stops.) The motor is now idling. The wash process is activated by turning the wash control handle (D. Figure I) to the wash position. This action locks the doors of the machine, starts the wash process, for the time cycle for which the machine is set, and switches on the pilot light which remains burning until the end of the time cycle.

The details of the time control and locking devices are shown in Figure II. When the wash control handle (A. Figure II) is placed in the wash position, the switch (D. Figure II) is thrown to the "ON" position. The time relay (F. Figure II) is energized, and this in turn energizes the solenoid (E. Figure II) and lights the pilot light (G. Figure II). The solenoid pushes the interlock rod (C. Figure II) forward, locking the wash control handle in position, preventing the opening of the machine doors. The time relay is set for a predetermined period, at the termination of which the washing process is stopped, the pilot light is switched off, the solenoid is deënergized, the interlock rod is extracted,

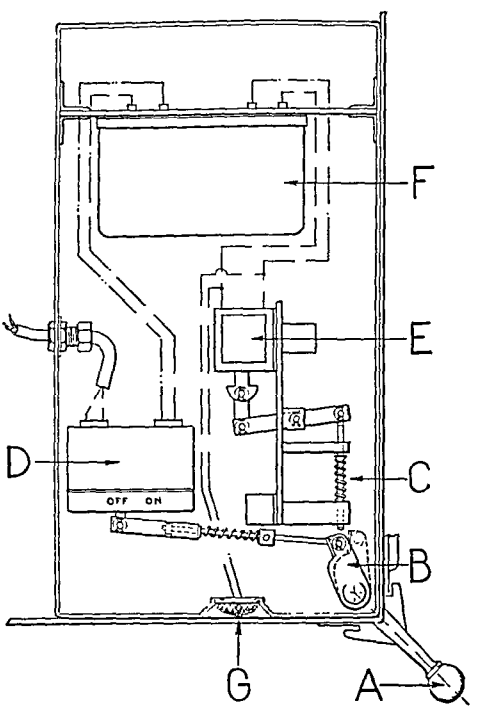


FIGURE II—CONTROL BOX

A. Wash and rinse control handle.
B. Switch operating arm.
C. Interlock rod.
D. Wash process operating switch.
E. Solenoid.
F. Time relay.
G. Pilot light.

and the wash control handle is released. The operator may now return the wash control handle to neutral or turn it to the rinse position.

In a series of experimental studies it was found that properly washed utensils were efficiently rinsed in from 8 to 10 seconds when clear water at 180° F. at 40 lb. pressure was used. This temperature is never maintained in hot water lines for general use. Since in this single tank machine, the hot water for the rinse process is delivered to the machine from the house hot water line, and it was impossible to install a booster tank or a special hot water boiler, it was found necessary to raise the temperature of the water delivered to the rinse nozzles at 180° F. without reducing the pressure below 40 lbs., by other means. After many failures, this was accomplished by the installation, on the rinse water supply line, of a regulating valve (designed to meet the local conditions of steam and water pressure), which mixed the steam with the water of the hot water line and delivered it to the machine at the required temperature of 180° F. The rinse water temperature gauge (H. Figure I) constantly shows the temperature of the rinse water. In operating the rinse, the handle of the regulating valve (G. Figure I) is turned to the heating position, indicated by H. on the face of the valve. The wash control handle is turned to the rinse position and held in this position by the operator for 10 seconds by the clock. In the improved automatic machine the operator will simply turn the wash control handle to the rinse position, initiating by this action an electrically controlled rinse cycle.

The automatic control features, with the exception of the door locking device, are adaptable for installation on both the single and multiple tank machines of various manufacturers.

Diphtheria Carriers—An English View

". . . A large number of individuals carry diphtheria bacilli temporarily, who are no danger to others and who are developing their own immunity. The unsystematic hunting out of carriers by indiscriminate swabbing is therefore to be deprecated. It is much more practical to make local clinical conditions the sole criterion for swabbing. In every carrier, and in every doubtful case of diphtheria, virulence tests and Schick tests should be performed: only thus is it possible to classify carriers and separate out those that matter.

The solution to the carrier problem is, however, available. It is to immunize the susceptible population and stop bothering about the carrier."—The Problem of the Diphtheria Carrier, by M. Mitman, M.D., M.R.C.P., D.P.H., Medical Superintendent, Eastern (L. C. C.) Hospital, *J. State Med.*, May, 1937, p. 256.

Rabies Deaths in Alabama*

Analysis of Case Histories With Regard to Treatment

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THE prevention of rabies in humans by the administration of antirabies vaccine to those bitten by rabid animals is a secondary, though necessary, feature in the control of the disease. In those localities, such as Alabama, where it has been impossible to institute or enforce effective measures for curbing the disease in dogs, the manufacture and distribution of antirabies vaccine has become an expensive and tedious problem of public health administration; expensive because of the ever increasing amounts of vaccine required, and tedious because of the countless multitudes who require individual attention and concrete advice concerning the necessity for taking treatment.

The incidence of rabies in Alabama has been recently reported by Baker, McAlpine, and Dowling (1936) [1] but for the period of this study may be briefly reviewed (Table I). From January, 1922, to August, 1936, a period of 14 years and 7 months, 9,282 animals received a positive laboratory diagnosis of rabies, 34,864 individuals were given antirabies vaccine, 42 persons died of the disease; and this in a population of between 2,000,000 and 3,000,000.

Despite a sixfold increase in the incidence of the disease among animals, human mortality has been maintained at a low figure, apparently by a similar increase in the administration of antirabies vaccine. Mortality rates per 100,000 of the population have remained so insignificantly low that such fluctuations as do occur are of no importance. Likewise, mortality rates among the treated population have remained consistently low and compare favorably with figures published by McKendrick (1935).[7]

ANALYSIS OF QUESTIONNAIRES

During the period of study both attenuated and phenol killed virus have been administered—commercially prepared Pasteur treatments from 1922 to 1930, and Semple treatments from August, 1929, to the present time. Commercially prepared Semple vaccine was used until February, 1931, when the State Health Department undertook both its manufacture and distribution.

Circumstances of exposure greatly

* Read before the Laboratory Section of the American Public Health Association, at the Sixty-fifth Annual meeting in New Orleans, La., October 20, 1936.

TABLE I

Prevalence of Rabies in Alabama

Year	Rabid Animals	Individuals Treated	Per cent Mortality Following Treatment	Mortality (among treated and untreated) per 100,000 of the general population
1922	161	545	0.18	0.04
1923	218	586	0.17	0.12
1924	639	1,272	0.16	0.08
1925	607	1,413	0.07	0.08
1926	761	1,775	0.06	0.12
1927	547	1,424	0.07	0.15
1928	560	1,781	0.17	0.15
1929	526	1,525	0.07	0.04
1930	442	1,785	0.11	0.11
1931	613	2,715	0.00	0.11
1932	836	3,487	0.00	0.07
1933	827	3,635	0.11	0.18
1934	1,017	5,398	0.04	0.14
1935	977	5,001	0.02	0.14
1936*	551*	2,522	0.04	0.06†
Total	9,282	34,864	0.06	0.11

* 7 months. † Estimated for year.

influence the mortality which may follow any type of treatment. Our information regarding such data extends only from July, 1933, when detailed questionnaires were first distributed with the vaccine. While the information is far from complete, we have endeavored to tabulate returns for the 3 year period, July, 1933, to July, 1936, and to correlate them, in so far as possible, with data taken from the first six reviews made by McKendrick [2-7] for the League of Nations. Inasmuch as our data cover only Semple treatments, only the figures relating to killed phenol vaccine are taken from McKendrick's reports.

While the number of returns from Alabama on which these data are based is necessarily small in relation to those given by McKendrick, we feel that they are reasonably representative. The

TABLE II

Analysis of Questionnaires, July, 1933–July, 1936
Types of Exposure Among Those Receiving Vaccine

	Alabama		McKendrick *	
	Based on	%	Based on	%
Dog, Biting Animal	8,879	87.0	230,762	87.9
Laboratory or clinical diagnosis of rabies on biting animal	8,766	61.0	220,894	11.1
Location of bite	5,698	..	136,022	..
Head		5.7		5.4
Trunk		1.8		3.5
Arm		67.3		36.8
Leg		25.2		54.3
"No visible lesion" following exposure			230,516	6.9
Exposed but not bitten	5,906	48.5		

* Figures compiled from first 6 reviews of McKendrick [2-7] as published by the League of Nations, only those treated by phenol killed vaccine are included.

proportion of bites by dogs in both instances is practically the same. Dogs were the biting animal in Alabama in 87 per cent of 8,879 returns, and in 87.9 per cent of 230,762 returns reported by McKendrick. In Alabama 61 per cent of animals received a positive laboratory or clinical diagnosis of rabies, while in McKendrick's series only 11.1 per cent were so diagnosed. From this difference it would appear that treatments given in Alabama followed exposure to rabid animals more often than in McKendrick's series where a diagnosis of the animal's condition was less frequently made. The proportion of bites occurring on the head and trunk are relatively the same in both instances. Arm bites are much more frequent in Alabama and leg bites less so, than in the localities from which McKendrick obtained his information. These differences may be partly explained by the wider variety of biting animals in Europe and Asia but more likely represent differences in exposure of the arms and legs due to different methods of travel. In Alabama travel is probably less often by foot or by bicycle, and is most often by automobile. McKendrick reports 6.9 per cent as taking treatment when "no visible lesion" existed. In Alabama 48.5 per cent of 5,906 treatments were administered to persons who were "exposed but not bitten," however, in the majority of such instances visible lesions (cuts, scratches, abrasions) were subject to contamination with the saliva of rabid animals. These latter figures are by no means directly comparable but seem to indicate that more people in Alabama probably take treatment without being actually bitten than in the localities from which McKendrick obtained his data. These latter circumstances favorably influence our mortality rates among treated cases for such individuals are subject to very little risk.

RACE

McKendrick (1935) [7] found that among those treated the mortality for non-Europeans was 4.5 times that for Europeans. He has shown that a number of factors such as the location and severity of the bite, the time interval before beginning treatment, and methods of diagnosis, play important parts in this racial difference. To quote McKendrick (1934) [6]:

> It would appear that no single one of the factors which reduce the racial difference in mortality is in itself sufficient to account for the racial difference, but that they all participate in it.

In Alabama 90 per cent of treatments are administered to whites and only 10 per cent to negroes. Applying these percentages to the full period of study and considering the extent of the population (white and colored) this means that whites take treatment 6 times more frequently than the colored. Despite this fact, the rabies mortality rate per 100,000 for whites exceeds that for the colored. Furthermore, negroes are more often exposed to rabid animals than whites because the negro has ordinarily more dogs per household, he lives in closer and more intimate contact with these animals, and he is continually taking in stray animals.

A partial explanation of what, at first hand, may appear to be a racial difference in susceptibility to rabies lies in the fact that (1) some of the poorer whites, and many negroes neglect treatment when actually bitten by rabid dogs, (2) the majority of such persons are not infected, and only a relatively few develop the disease, (3) as compared with the colored, the white population receiving treatment is diluted with large numbers of individuals who have not in reality been exposed. This largely accounts for a mortality rate of only 0.05 per cent for treated whites and 0.16 per cent for treated negroes. It further demonstrates a tremendous

waste of vaccine that might better not have been given.

VACCINE PARALYSIS

Following the administration of 25,064 Semple treatments local reactions, usually erythematous patches at the site of injection, have been occasionally reported. One case of abscess formation was relieved by drainage. On one occasion virulent hemolytic streptococci were injected into 5 patients by a physician who used the same unsterilized syringe and needle for all when giving the 14th dose. Four paralytic accidents have occurred with Semple vaccine, involving 2 children and 2 adults. One was of the Landry type; none were fatal. One completely recovered, 3 have marked residual paralysis. Though 1 case was diagnosed as poliomyelitis, for purposes of record we would rather consider all as due to the vaccine. Paralytic accidents occurred in the proportion of 1 in 6,300. McKendrick (1935) [7] in his 6 reviews found the incidence to be 1 in 10,152 for killed phenol vaccine.

FATALITIES

Of the 42 fatalities from rabies, 21 had received antirabies vaccine while 21 had not. Sixty-two per cent were male; 48 per cent were children under 13 years of age; 63 per cent were rural; 71 per cent were white. As regards age and sex, distribution was approximately the same among treated and untreated, and among white and colored. Among the whites 53 per cent received treatment: among the colored, treatment was administered to 42 per cent. Forty-four per cent of rural cases and 60 per cent of urban cases were treated.

Data regarding the type of exposure among the 21 treated cases are shown in Table III. All were known to have been bitten, though complete information regarding the severity of biting is lacking. Bites were known to have been severe in 12; multiple in 6; 8 were on the head, and 7 on the arm, hand, or fingers. None were known to have occurred on covered parts of the body.

TABLE III

Severity of Biting

	21 Treated Cases	*21 Untreated Cases*
Severe	12	3
Not severe	..	4
Not reported	9	14
Single bites	11	6
Multiple bites	6	2
Not reported	4	13
Bite on head	8	3
arm	7	4
trunk	1	..
leg	3	..
Not reported	2	14
Bite on uncovered parts of body	18	7
Bite on covered parts of body	..	..
Not reported	3	14

Complete or reliable information among untreated individuals is lacking for in the vast majority the possibility of rabies was not considered until the disease had actually developed. Most likely all untreated cases were bitten, though in 3 no definite history of an actual bite was obtained. One was a child of 3; 1 a man of 63, a stranger in the community about whom little was known; 1 was a man of 80 who developed rabies 2 days after "doctoring" a rabid dog, but he unquestionably received his infection at least several weeks earlier. The untreated group also includes 3 individuals who took only several injections of vaccine. One received 2 injections, 1 received 3, while the third individual received 4 injections in the 4 days preceding the development of symptoms. Quite obviously those cases do not represent vaccine failures.

TABLE IV

Fatalities Among Treated and Untreated Cases

	Interval Between Biting and Administration of Vaccine			*Incubation Period*							*Duration of Disease*			
	Days			*Weeks*		*Months*					*Days*			
	1–3	*4–6*	*21*	*2–3*	*3–4*	*1*	*2*	*3–6*	*12*	*Not reported*	*2–7*	*8–14*	*21*	*Not reported*
21 Treated cases	14	6	1	3	10	2	..	6	..	..	13	1	1	6
21 Untreated cases	..	..	..	6	3	4	2	2	1	3	13	3	..	5

Among the 21 cases representing vaccine failures, treatment for 20 began within 6 days after exposure, 1 after 3 weeks. The short incubation period of 2 to 4 weeks in 13 treated and 9 untreated cases indicates that the degree of infection was such that vaccine could hardly have been expected to save many of these individuals. Data regarding the duration of disease are not remarkable except that the apparent early death in some cases is more likely due to late diagnosis. One doubtful case complicated by German measles and jaundice lived 3 weeks after the symptoms of rabies had supposedly developed. It has been included although the diagnosis is seriously questioned. When suspected cases of rabies live beyond the second week it is usually time to change the diagnosis.

MORTALITY RATES AMONG THE TREATED

A total of 9,800 Pasteur treatments were given with 11 deaths, a mortality of 0.11 per cent. A total of 25,064 Semple treatments were administered with 10 deaths, a mortality of 0.04 per cent; 2,783 of these treatments were obtained commercially while 22,281 were prepared by the State Health Department. The total mortality among 34,864 treated cases was 0.06 per cent.*

These rates compare most favorably with those given by McKendrick (1935) [7] who, in a summation of 6 analytical reviews for the League of Nations, reports a mortality of 0.38 per cent among 78,400 treated with dried or glycerinated cords, and a mortality of 0.61 per cent among 233,488 treated with killed phenol vaccine. To quote McKendrick (1935) [7]:

> It may seem surprising that figures amounting in all to about half a million are insufficient to demonstrate differences in efficiencies of various methods of treatment.

* If all persons not actually bitten are eliminated, the number of treatments is reduced approximately one-half (48.5 per cent), and the mortality rates are doubled though still compare favorably with those of McKendrick.

TABLE V

Mortality Rates with Different Vaccines

Vaccine	*Years*	*Number Treated*	*Number Deaths*	*Mortality Per cent*	*McKendrick Mortality‡*
Attenuated cord, Pasteur (commercial)	8*	9,800	11	0.11	.38%
Phenol killed, Semple	7*	25,064	10†	0.04	.61%
Total	14½	34,864	21	0.06	

* For the last 6 months of 1929 both Pasteur and Semple treatments were administered.
† Includes the 1 case in which the diagnosis was doubtful.
‡ All 6 analytical reviews.

In view of this, no statement regarding the efficacy of the vaccine used in Alabama seems warranted beyond the assertion that the results obtained appear satisfactory.

SUMMARY

Despite a sixfold increase in rabies among animals in Alabama, human mortality has been maintained at a low figure by a similar increase in the administration of antirabies vaccine to those exposed. Circumstances of exposure, as tabulated from 8,879 questionnaires, have been correlated with data taken from McKendrick's reports. Factors explaining what appears to be a racial difference in susceptibility to rabies are discussed. Case histories of 42 fatalities are analyzed. Vaccine paralysis occurred among 1 in 6,300 of those treated with Semple vaccine. Since 1922, 9,800 Pasteur treatments were administered with a mortality of 0.11 per cent; 25,064 Semple treatments were administered with a mortality of 0.04 per cent.

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Driver's License Law

IN most states no provision is made for the furnishing of evidence of physical or mental fitness of motor vehicle drivers. This condition is particularly deplorable since the National Safety Council has made available to all states a model driver's license code.

The importance of adequate driver's license laws is shown by a 9 years' trial. In this time, states having a standard license law have decreased vehicle death rates by an average of 20 per cent, while all other groups of states have increased their death rates, some more than 30 per cent. The committee recommends the adoption of the uniform driver's license law by all states, since this would be an additional factor in traffic safety and would not only give the states some control over the driver with physical and mental defects but would be of additional value in collecting records of the chronic law violators, the reckless, and the "accident-prone." Persons having bad records would be examined for physical, mental, or psychologic abnormalities with a view toward correction or possible compensation for the deficiencies, or if this is not possible licenses may be revoked.—Preliminary Report of Committee to Study Problems of Motor Vehicle Accidents, American Medical Association, *J.A.M.A.*, June 19, 1937, p. 2138.

Nursing Services for Mothers and Children as Part of a Balanced Public Health Nursing Program*

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ALTHOUGH the health of mothers and babies depends, of course, upon the general community provisions for public health, we know from long-accumulated evidence that special provisions, too, are necessary within the framework of the total public health program because of the special conditions of health peculiar to maternity and early childhood.

These conditions of health, particularly identified with pregnancy and parturition and with infancy and early childhood, require a special approach, intensive consideration and treatment.

However, special approach in this sense is not meant to imply service through a special program, agency, or worker, but rather particularization of emphasis and intense awareness of the characteristics special to maternity and childhood within a total family health service.

It is self-evident in the planning and administration of public health nursing services that special attention must be provided for certain phases of the nursing services on the basis of special needs arising out of actual health conditions rather than on the basis of external factors of the program, such as special funds or budgets or special agency or personnel interests.

Actual health needs are the only real determinants; all others are artificial and usually hinge upon expediency rather than soundness of service. We know, for instance, that disease is selective as to age; that people have their health affected, or die, from different causes at different ages. Some causes are definitely identified with early infancy, some with later childhood, some with childbearing. A comprehensive, well balanced public health program, then, will make allowance for these differences by providing special care and attention for each age group. It is entirely possible to reconcile special health provisions with a generalized health program; just as it is possible to reconcile intensive attention to special needs, such as those arising out of maternity and childhood, with a general public health nursing service, given by generalized public health nurses.

* There seems to be a growing tendency toward regional conferences of professional groups in the field of public health, in lieu of or as supplementary to larger meetings of national scope. Such conferences have proved effective because of the possibility they offer to give more intensive consideration to issues of a concrete nature and of immediate concern to the conferees.

This paper was presented at such a regional conference of directors, or their equivalent, of public health nursing services in state departments of health of the 9 states which comprise the northeastern consultation area for medical and public health nursing consultants of the U. S. Public Health Service and the U. S. Children's Bureau.

In terms of present-day public health nursing in state departments of health, it is interesting to reflect upon the various types of organization and administration which exist, as an index to the degree of comprehensiveness and balance of public health nursing service which such administrative provisions reflect.

Needless to say, public health nursing in the various states of this vast and complex nation is represented by several types of organization and channels of administration within the state departments of health. There are differences in stage of development, origins, and motivations, not only between various sections of the country but between states within a given section as well. The situation in the 9 states of the northeastern area here represented, before the social security provisions went into effect, was as follows:

1. There were states where all public health nursing originated in, and has remained an adjunct of one administrative unit or bureau —notably a bureau of child hygiene.
2. There were states where public health nurses were attached to each of several administrative units or divisions, such as divisions of child hygiene, tuberculosis, syphilis, and gonorrhea.
3. There were states where public health nursing was administered through a division or unit of its own, the intention being to make public health nursing available to all other divisions or bureaus of the state health department.
4. There was in one state, a unit or division of public health nursing, presumably giving service in all branches of public health, where public health nurses were also an adjunct of another division—namely, the division of maternal and child health.

It is significant to note that in several states where situation No. 1 prevailed before the passage of the Social Security Act, divisions of public health nursing have since been created as administrative units, separate from the maternal and child health division though serving that division as heretofore.

The reason for dwelling on the administrative provisions for public health nursing in state departments of health, before and after social security legislation became effective, is to show that there is a tendency toward the broadening of the concept of public health nursing service, rather than restriction or specialization, in spite of the fact that there are, to a greater extent than ever before, special emphases, as a result of special federal and state appropriations for care of mothers and children.

In other words, it is becoming clearer, through experience, to public health workers and others that public health nursing services to one age group or for any single type of condition is only as good as the total provisions for health of the family and the community. No one type of public health nursing service can be isolated and strengthened much beyond the total public health nursing service of the community. However, service must be planned proportionately, with the needs peculiar to various conditions and ages as the criteria for emphasis.

Whatever the administrative arrangement for conveying public health nursing services, we are all faced with the same dilemma—the same old dilemma, let me add. How, with the forces at hand can a complete, well rounded, public health nursing service be made available to all families requiring such service, at the same time giving liberal, concentrated attention to the many special health conditions connected with maternity, infancy, and childhood?

Maternity and child care have been a part of public health nursing since public health nursing began—that is, they have been included to some extent both in terms of numbers of individuals served and also in terms of amount, degree, and quality of care given the individual served.

Even so recently as 1934, the public

health nursing survey by the National Organization for Public Health Nursing [1] revealed some striking gaps or deficiencies in maternity nursing service, as well as qualitative strengths in the one phase of maternity care to which public health nursing has given most attention. It showed:

1. That although prenatal care is more extensively given than any other type of maternity nursing service, and better given than other types of public health nursing services, early contact with pregnant women is still more of a theory than an accomplished fact. A complete plan for maternity nursing service presupposes getting all the pregnant women of the community under medical care early in pregnancy, but the degree to which this is accomplished in any given community is still largely guesswork.

2. That nursing service for home deliveries is being provided to a very small extent in cities and practically to no extent in rural areas. And yet we have known for a long time that conditions associated with the delivery itself account for a high proportion of infant deaths and illnesses. Hence the combined efforts of all types of health workers, one would suppose, might be directed to making this particular stage of childbirth as safe as possible, in the home and in the hospital. The fact that about one-third of neonatal deaths are attributed to infection acquired before, during, and after childbirth should in itself give some clue to the probable necessity for nursing service at this time.

3. That nursing care of the mother directly after childbirth, though available more extensively than care at delivery, is still not provided in many homes. Comparatively few public health nursing agencies, according to findings of the survey, provide definitely and consistently for instructions and help with arrangements for the medical examination of mothers and babies after 6 weeks or so immediately postpartum, and yet this is generally conceded to be one of the most important measures for maternal and infant health protection.

When we consider the field of child health we are confronted with the discomforting realization that educational content in child health supervision services, as indicated by the criterion, "teaching," is consistently meager and inadequate; as the age ascends the inadequacy increases; that is, the educational content in infant health supervision is low; in preschool health supervision it is lower, and in school health supervision it is lowest.

At the risk of seeming to introduce too negative and skeptical a note into this consideration of public health nursing as it relates to maternal and child care, it seems important to take into account what we know of our own professional performance in these fields. Although public health nursing is only one factor, dependent on many others, in this situation of providing to all mothers and babies a good quality of care and can only develop in relation to economic, social, and medical factors, nevertheless there are qualities intrinsic to public health nursing performance within our control as a professional group.

The fact that the situation in regard to deaths and illness among mothers and babies has remained practically unchanged for 20 years in spite of the combined efforts of health workers is always before us as the supreme challenge.

"Why does the death rate among mothers due to causes of childbirth remain so unnecessarily high?"

"Why does the high death rate among babies under 1 month persist when rates have been lowered among babies of 1 month to 1 year?"

"Why do so many babies die after 1 year of age?"

These are some of the questions always before us when we participate in planning and taking part in public health programs—federal, state, or community. For mothers and children being merely alive is only a small part of the whole story of being alive and well.

The effects of a depression, which are still very real to us, are known to be more devastating to children than to adults, not necessarily in terms of death, but in terms of development and stamina. The effects of deprivation are

deep-seated. They arise from worry and tension resulting from family insecurity as well as the physical deprivations—poor housing, lack of adequate food and clothing, and other necessities of life. "The less a man has the more he needs" can be said to pertain to health services as well as food, clothing, and shelter, and presents an extra responsibility to us for more and better nursing care.

This conference is intended primarily to give those who are directing public health nursing services in the states of this region an opportunity for exchanging ideas at a period when state and federal provisions are in effect for extending and improving public health service.

I shall, therefore, take time only to restate as a possible basis for discussion some of the concepts and principles of public health nursing, pertinent to maternal and child care, which have evolved from our own professional experience.

There is naturally, I suppose, still some disparity between the theoretical acceptance of these principles and actual application and adaption to the job at hand.

A comprehensive, well balanced public health nursing service for the family and community rests primarily upon adequacy of personnel, both quantitative and qualitative.

The census of public health nurses in the United States, as of January 15, 1936, shows the ratio of public health nurses to total population by states in the 9 states of the northeastern area (see Table I).

For the United States as a whole, 1 nurse to a population of 7,714 was the ratio as of the same date.

For 5 of these northeastern states the ratio was 1 nurse to a population of 3,000 to 4,000, whereas for 4 states it was 1 nurse to a population of 4,700 to 6,900. Although an arbitrary population ratio is recognized as only a crude index for measuring the amount and kind of public health nursing service required, it does indicate quantitative inequalities of distribution in any given section. Interestingly enough the 9 states here considered represent the highest ratio of public health nurses to population, collectively and separately, in the United States. There are only 5 other states with populations per nurse under 7,000, and 2 of these (Delaware and Maryland) are near the 9 states here discussed. For these 5 states the population per nurse is as follows: Delaware, 5,400; Michigan, 5,400; Maryland, 6,200; California, 6,600; and Ohio, 6,800.

TABLE I

State	*Population per Nurse*
Vermont	6,900
Maine	6,500
Pennsylvania	6,400
New York	4,700
New Jersey	3,900
Massachusetts	3,700
Rhode Island	3,500
New Hampshire	3,300
Connecticut	3,100

From this we see that the problem of public health nursing from the point of view of quantity alone is not the most pressing in these states. However, the lack of centralization of organization, supervision, staff education, qualification standards, etc., which results from the large number of small (having 1 or 2 nurses) private and official public health nursing organizations in most of these states has a tendency to diminish quality of service since it is unlikely that any one of the small-town agencies which predominate here can possibly afford to provide the conditions most favorable for the development of its public health nursing. For this reason, adding to the public health nursing resources and personnel of the state health departments and giving

greater emphasis to district and unit health organization, which have been made possible through the Social Security Act, should have a desirable effect on these highly local services.

A careful study of needs of the community in relation to numbers of public health nurses and types of service, based on all the factors involved—economic condition, industry, topography, climate, race, and nationality, has never yet been attempted.

However, the inference is that, with the additional public health nurses who have been appointed in the states through social security provisions, the ratio of nurses to population in the 9 states is now even higher than here indicated.

Qualified personnel, with provisions for education and supervision continuously, progressively available are fundamentals in a public health nursing service.

The survey of public health nursing showed us that the quality of performance of the public health nurse is in direct ratio to the amount and kind of nursing supervision provided. I shall not dwell upon this any further than to comment that we believe that there is decidedly a place for specialized supervision, educational rather than administrative in character, within the scheme of public health nursing administration. This specialized supervision, in the field of maternal and child health, for example, if filtered through the channels of generalized supervision, will not only enhance the content of nursing service but will insure balance through proportionate emphasis on quantity and quality.

State departments of health of the region here represented are more and more making this supervision available for their own staffs as well as for other public health nurses of the state, chiefly those working alone—by the appointment of educational supervisors or directors, or by the appointment of specialized nurse-consultants or supervisors.

A comprehensive, well balanced public health nursing program carries the implication of equally adequate provisions for care in all stages of the maternity cycle: antepartum, intrapartum, and postpartum. Although, by and large, in public health such complete provisions have not been prevalent enough for us to have obtained tangible evidence as to their superiority, we can assume that complete service of good quality will be more effective than partial service.

The public health nursing services for mothers and infants can obviously not progress or develop fully where medical, economic, and social resources are undeveloped. It is not enough, then, for us to contribute only our technical best under present circumstances; we have also a part to play as supposedly enlightened members of society, in influencing the larger circumstances implied in social security, which affect provision of good, complete care.

Howard Odum of the University of North Carolina says, "Social security may be an epochal term or a whimsical technic depending on how well it is administered by the state agency responsible for it." This, I believe, can be applied to all types of service involved in the attainment of social security, public health nursing included.

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Asphyxiation and Death in Oxygen Deficient Air

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ON August 28, 1935, an employee of Mann Brothers Linseed Crushers Company, Buffalo, N. Y., was sent down into an oil reservoir that had been closed for 3 months, to clean out the " foots " at the bottom. The only means of entrance was a manhole about 18" in diameter through which a ladder was placed. When the man had gone about half-way down the ladder he collapsed and fell into the oil, apparently unconscious. Another employee followed in an attempt to rescue him and suffered a similar fate. A third employee started down cautiously, but when he noticed difficulty in breathing, climbed out. Although weak and exhausted he recovered quickly. The Fire Department was called and a fireman, equipped with a gas mask, entered the tank. He immediately lost control of himself and fell to the bottom. A second fireman, equipped with a gas mask, but with a line about him, descended. He, too, became helpless, but was taken out at once. After breathing fresh air for a time, he regained his senses. By the time the 3 victims were removed from the reservoir, with the aid of grappling hooks, about 20–25 minutes had elapsed and they were dead.

Investigation of the conditions in the plant revealed that there never had been a cyanide fumigation, nor the possibility of the presence of carbon monoxide resulting from an incomplete combustion or leak in the gas lines. There was no odor of hydrogen sulphide, arsine, or any other irritating gas. The only thing noticeable was the odor of fish oil, a condition which comes about naturally when linseed oil stands for some time with water.

It was stated by the employers that employees had been entering the oil reservoirs for the last 20 years and had never experienced trouble before. There were 5 other reservoirs of the same type in which conditions were apparently normal in so far as the ability of the men to work in them was concerned.

On questioning the plant foreman on the method of oil purification, it was learned that a large volume of oil, after it came from the presses, was treated with dilute caustic soda, allowed to settle, neutralized with sulphuric acid, and the resulting " foots " pumped into the tank where the deaths occurred. The clean oil was pumped into the other tanks. The fact was, therefore, fairly well established that the " foots " contributed in some way to the conditions that caused death.

Samples of air were collected in various parts of the reservoir by means of a long rubber tube attached to a pole long enough to reach to the farthest ends of the tank. The tubing was connected to gallon bottles filled with water, which had bottom and top outlets.

Tests made for combustible gases in the tank with the M. S. A. apparatus showed a zero percentage until fresh air was passed into it. Combustible gases then registered 3 per cent indicating absence of sufficient oxygen for combustion. Lighted candles attached to wire when placed in the tank were immediately extinguished. Two white rats died in about 10 minutes when lowered into the reservoir.

The air samples previously collected were analyzed by a Morehouse apparatus with the following average results for 5 samples:

	Per cent
Oxygen	1.6
Carbon Dioxide	10.8
Hydrogen	4.9
Nitrogen	82.7

The blood of the victims, which was definitely fluid, was tested for carbon monoxide by the Sayres tannic acid method, the spectroscope, and the Van Slyke monometric blood-gas apparatus, with negative results. One hundred c.c. portions of the blood acidified with tartaric acid were steam distilled into N/2 sodium hydroxide to collect any hydrocyanic acid that might be present. The alkaline solution was evaporated to a very small volume and tested for cyanide with silver nitrate and the prussian blue method, with negative results.

From these results and the analysis of the air in the chamber it was quite evident that the men had died from the effects of oxygen deficiency and the presence of a carbon dioxide tension that far exceeded that in alveolar air.

In order to determine what brought about this oxygen deficiency the oily mass in the bottom of the reservoir was given a complete chemical and bacteriological examination, the results of which were in complete accord with the facts already known.

Microscopic examination of the material showed the presence of growing yeast cells, molds, and bacilli.

The composition of the mixture was as follows:

	Per cent
Water	26.3
Soap	10.2
Oil	58.3
Protein	4.2
Undetermined	1.0
Water soluble acids	0.24
Acid value of oil	140
Saponification value	178

The presence of protein matter seemed to be the unusual element in the mixture and was isolated by first washing with toluol to dissolve the fatty matter and separate the water. It was then washed several times with hot alcohol to dissolve the soap. The material had the same composition as linseed meal and was, undoubtedly, that portion of the meal that had passed through the filter presses with the oil.

This meal when inoculated with ordinary baker's yeast underwent rapid fermentation giving off about 95 per cent carbon dioxide and 5 per cent hydrogen. Linseed meal, obtained from the plant, fermented in the same way when mixed with ordinary yeast.

The fact that there had never been any trouble with these tanks before naturally made it appear quite mysterious to the operators of the plant, but this accident was quite plainly the result of the right combination of a varying set of conditions. The reservoir had been closed for 3 months; the weather was warm; there was water and protein matter in the tank. The very fine linseed meal, which had passed through the filter presses with the oil, had accumulated in the bottom of the tank and had begun to ferment, giving off carbon dioxide. Carbon dioxide, being a much heavier gas, underlaid and displaced the air upward and

the drying property of the linseed fatty acids further diminished the oxygen content.

The trouble was easily corrected by pumping air into the tank but, had the well known rule been observed—that no person be allowed to enter any tank or reservoir without a line tied about him and a second person present to pull him out in case of trouble—3 lives would have been saved.

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"WHILE many of the specialties are overcrowded there is still a shortage of well trained, experienced physicians in public health work. . . . The field of public health for physicians is expanding rapidly. The public itself is demanding better community care. Examples of agencies where public health physicians are used are the U. S. Public Health Service, Children's Bureau, state, city, and county health departments, nonofficial health agencies, and foundations, insurance companies, and industry." Medical men . . . "have focused their attention so sharply on their own individual patient and his disease that they have failed to realize that around them are community problems and community responsibilities about which they should know and in which they should share."—Dr. John L. Rice, 39th Commencement of Cornell University Medical College.

Rat Surveys and Rat Proofing

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ACCORDING to data obtained from almost world-wide sources, and published in many of the pamphlets issued by the U. S. Public Health Service and other government agencies, including bulletins issued by the U. S. Department of Agriculture, the rat is not only the least useful, but is perhaps one of the most dangerous and expensive of nature's parasitic animals living at the expense of man. Of all disease-bearing animals, the rat probably stands supreme in the cost it has entailed upon mankind in lives and money.

It is estimated that in any given community, the rat population equals that of the human inhabitants. They are very prolific, producing on an average of 5 litters a year, of from 6 to 9 each. The cost of feeding a rat is placed at ½ cent per day, or almost $2 per year. Assuming that the estimated rat population in the United States is equal to the number of persons shown by our last census, the cost of feeding rats will reach the staggering sum of $240,000,000 annually. In addition, they pollute and render unfit for consumption quantities of supplies many times in excess of what they eat, and destroy all kinds of articles and merchandise.

Since such economic losses and sanitary risks are shared by almost everyone the world over, whether or not this fact is known and appreciated, the hand of man, in all lands, has been raised against the rat. Almost every known means has been employed to reduce their numbers, or to exterminate them. Usually the interest of the average citizen in this matter becomes aroused only when it is brought to his own door, and either he or his family are annoyed by their presence, or they sustain economic loss. It expresses itself in the periodic drives, trapping and poisoning campaigns which are carried out from time to time.

From what is known of the breeding habits of rats, their fecundity, their resourcefulness, their adaptability to almost any condition, and their ability to subsist on any kind of diet (their bill of fare includes almost anything in the vegetable and animal kingdom), the magnitude of the task of rodent control can be better appreciated. The problem is one of grave public concern and can be solved in whole or in part only by continued and persistent effort in carrying out measures that are known to produce effective, permanent results, so that freedom from rat life will be the normal state. It is the maintenance of this condition rather than the periodic reduction of the rat population that will confer the highest degree of protection to the public health, as well as lessen economic losses.

The problem of control is three-sided. It concerns health, economics, and technic.

The public health official, whether national, state, or municipal, is interested in permanent control because it aids in reducing the risk of the trans-

mission of certain diseases, principally bubonic plague and typhus fever. Prevention of the spread of these diseases is his main objective.

On the other hand, owners of property and merchandise are interested primarily in reducing the destruction of supplies of almost every kind by rats. Prevention of economic loss is their objective.

The solution depends largely on the application of technical methods and the use of common sense. As one authority says: "The permanent exclusion of rats involves primarily the proper construction, repair, and upkeep of buildings, and keeping the premises in a sanitary condition."

Rat life exists and persists in buildings and elsewhere because of certain favorable structural and incidental conditions, which enable them to hide, build their nests, and breed. If these conditions are changed, either through the employment of a different design, construction methods, or materials impervious to gnawing by rats, or altered by repair work so that the harborages are either eliminated or protected in such a manner that rats cannot get into them and build nests, and breed, colony rat life will be permanently controlled.



FIGURE I—Example of structural rat harborage existing in the enclosed spaces formed by double walls and raised flooring

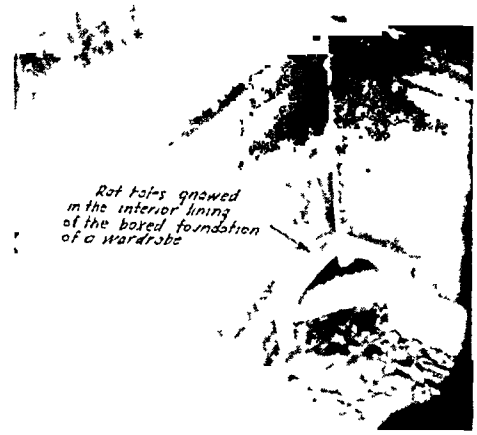


FIGURE II—Example of incidental rat harborage existing in the boxed foundation of a wardrobe. Note rat excreta and nesting material on floor and large rat hole in the back corner. Several nests containing baby rats were found in this space.

The first step, therefore, is to become thoroughly acquainted with the conditions which favor rat life (that are known as harborages), to be able to recognize them and to appreciate the effect which their existence has on rodent propagation.

There are 3 general types of rat harborages: (1) structural, (2) incidental, and (3) temporary. Examples of the first are double walls, spaces between floors and ceilings, and beneath basement floors, or those that rest flat on the surface of the ground.

Those of the second are furniture, fixtures, and equipment, things that are incidental to the use that is made of

the building or its subdivisions, and are installed therein.

Examples of temporary harborage are mass storage of material or merchandise, rubbish heaps, old furniture, odds and ends piled in cellars, attics, closets, etc. Any such material if left undisturbed for periods of several weeks can and will be used for homes and breeding places by rats.

The preliminary work in any campaign of rat control is that of survey. The conditions existing in each district and subdivision must be known; therefore, inspectors should become conversant with the various types of harborages, be trained to recognize them and to evaluate their relation to rat propagation. They should learn how to look for signs of actual rat infestation of premises, such as fresh excreta, rat gnawings, marks of rat runs, or damaged merchandise and supplies. The physical state of the excreta found will usually tell whether the infestation is of recent origin. If the excreta is of putty-like consistence and can be rolled out like a pill mass, it is more than likely that live rats are present. The quantity of excreta found will aid in determining the extent of the infestation.

The port sanitary authorities at Liverpool, England, some years ago carried on a number of very interesting experiments in order to determine the quality and quantity of excreta passed during a given time by captive rats. Each rat used in the test was confined in a separate cage which had a removable bottom pan. One group was fed on grain products, another on fruits and vegetables, while a third was given only meats and fish. The rats fed on grain products passed the greatest amount of excreta, averaging about from 70 to 75 pieces per 24 hours, while the group fed on fruits and vegetables averaged less than 50 pieces for 24 hours.

Knowledge of this character is of value to an inspector or surveyor and aids him in forming an intelligent estimate of the extent of the infestation.

The size of the various pieces of excreta discovered will determine whether family life is present and litters of young are being reared.

It will thus be seen that it is possible in survey work to learn 3 valuable



FIGURE III—Example of rat harborage of the temporary type existing in discarded material usually stored in attics and cellars

things through the examination of excreta found: (1) Whether the infestation is an old one or of recent origin; (2) from the quantity and location, the probable extent of the infestation; (3) from the various sizes of excreta, whether families of rats are being reared.

It is not so easy to differentiate between an old and recent rat run. By washing off a small area of a well defined run or by covering it with paint or white chalk, it will be easy to check up on any section where doubt exists as to present infestation. The rat is such a creature of habit that he will continue to run over the beam or pipe where the original run was located.

Recent gnawing into wooden base boards and sheathing around pipes and other lines can easily be determined by its fresh appearance and the presence of shavings or débris. The same will be found to be true to a great extent of gnawings into and damage to merchandise and food supplies.

Properly conducted surveys of buildings and structures will disclose the following facts: (a) the absence or presence of actual infestation and its extent; (b) the type of existing harborage and the coincidence of its use by rats as breeding places.

During 1934 and 1935 surveys similar to what has been described above were conducted in Greater New York as a part of the typhus fever control project which was directed and supervised by officers of the U. S. Public Health Service. While the main objective was to get a line on the flea index of the rats living in the various districts of Greater New York, advantage was taken of the opportunity to get data relating to rat infestation and the existence of rat harborage in the buildings surveyed and trapped. Some interesting facts were revealed as to both.

The principal types of harborage discovered coincided with those found by other investigators in similar surveys: double walls, space under floors, the enclosed space formed by sheathing in the ceilings, in cellars, bins and lockers, particularly when they had a raised floor, the interstices between the stones of foundations, burrows formed in dirt floors and cellars, in insulated sections of refrigerators, in mass heaps of supplies and rubbish.

The points of entry into the enclosed spaces which formed harborages, where the rat either found an opening or made one for himself by gnawing, were noted and, in many instances, were photographed. Information of this character is all important. No corrective measures can be successfully applied until the weak or vulnerable spots and the factors that make them so are known and taken into consideration. They may be the result of poor design, faulty construction, use of non-rat-proof material, or the manner in which fixtures, etc., have been installed.

If of design, the permanent correction must be brought about by changes which should be made in drafting rooms. If the result of the use of materials that can be gnawed by rats, the remedy will be found in the selection of those that have been proved to be rat proof. Non-rat-proof material can be protected at gnawing margins by metal flashing.

Some tests of materials have been made by the U. S. Public Health Service in connection with its work of the rat proofing of vessels. It was rather a surprise to note some of the results obtained. In some instances rats were able to gnaw through medium soft aluminum sheets. Lead sheets, of course, are not rat proof and openings into them are easily made.

In conducting these tests, the colony of wild rats were isolated in a rat proof room. They were given living conditions similar to those found on ships

and in houses, the use of double walls, lockers, etc. and fed regularly. In most instances they were undisturbed for several months and allowed to bring up families. When it was desired to test a certain material, it was made fast to the end of the test box, which was entirely covered with wire mesh except on one side. Food was stored in this test box, the open end closed with a strip or sheet of the material to be tested, and placed in the rat proof room. For a week previous no food had been given to the rats living in the room so that they would feel very strongly the hunger instinct, and be immediately attracted to the test box with its visible food contents. Usually the rats would surround the box and try to find an opening which would permit them to enter and get at the food. They soon realized that the heavy wire mesh effectively barred their entry and that their only chance was in gnawing along the edges of the sheet material and making a hole big enough to enter. If they were successful, even though it took several days, the material would be considered not rat proof, and its employment in construction discouraged.

Construction and installation methods —There are many instances of heavy infestation of buildings ashore as well as ships afloat that have resulted from failure to observe one of the fundamental rules of rat proofing, *i.e.,* that there should be no openings greater that ½" in any double wall sheathing. Carelessness of workmen in not making tight fits or closing openings through which pipes, beams, electric cables, etc., pass, are responsible for many opportunities given to rats to gain access to harborage.

The general rule to be applied in the rat proofing of buildings, so far as the exterior is concerned, is to make them secure from invasion by protecting all known avenues of ingress, in the foundations, outer walls, doors, windows, various pipe and cable supply lines, down spouts, light and air shafts, and other roof openings. This gives what is known as the outer line of protection. It can be seen how important it is to know that the material which has been employed is of an anti-gnawing or rat proof character, that this has been installed in an approved manner, and that it is being maintained in good repair.

Absolute reliance should not be placed on the protection afforded by the rat proofing of the exterior of buildings since there are always natural openings, such as doors and windows, to be considered. It is here that the human element enters into the equation, and this is always the weakest link in the chain of protection. Time and time again it has been found that it cannot be depended upon. Rats come into the buildings through the doors and windows and proceed to avail themselves of the facilities offered in double walls, beneath floors, etc., for home making. We have records of a school building that was invaded by rats through a window in the basement, and quite a colony were living in boxed settees, pipe tunnels, etc.

Exterior rat proofing of small buildings can be accomplished by elevating the structure 2 or more feet from the ground, exposing the ground area beneath and keeping it clean and free from trash, dunnage and rubbish. The usual protection should be given to the natural and other openings. If the building is of double wall construction, they should be shut off by stopping the openings left between the studs and floor joists just above the sill. Various classes of material are employed for these fills, such as 2' x 4' wooden beams, sheet metal, brick, and concrete.

Rat proofing work in the interiors of older buildings which are infested

may be accomplished in an inexpensive manner if the plan of treating symptoms as they appear is followed. That is, to install metal collars, metal flashing, or other protective and anti-gnawing material over openings and holes leading into enclosed spaces and double walls that are used as harborages, and to continue this until all such openings have been properly protected and rat life has disappeared.

Where a structure is built on footings or foundations, these should extend at least 2′ below the surface and be of concrete or stone which has been cement-plastered to a smooth finish. Rats invade cellars and basements by burrowing under walls that extend less than 2′ below the surface. Experiments were conducted by officers of the U. S. Public Health Service some years ago to check up on the habits and activities of rats, and standard rat proofing work was outlined largely on the basis of their findings. Hundreds of captive wild rats were used in these tests, which were to determine to what depth they would burrow, their swimming radius, their ability to climb the various types of pipes, downspouts, exterior wall surfaces, their homing instinct, etc.

In addition, the ordinary everyday life habits of several hundred captive wild rats living under conditions similar to those to which they were accustomed on shipboard were observed and studied at Hoffman Island for almost 2 years. They were confined in a rat proof basement room, and during these 2 years none escaped. Eskey says:

"Rat proofing of buildings and the elimination of harborage near them not only will prevent man from coming in close contact with rats, but also will eliminate the most productive breeding places of the *X cheopis* (fleas)."[1] The flea is the transmitting agent of typhus as well as plague.*

While the observations of this and other plague experts as to the value of rat proofing as a permanent rodent control measure coincides very generally with our own experience, we do not delude ourselves with the idea that perfection has been attained, and that by the waving of this magic wand all the rats in a community can be made to disappear as in the legendary case of the Pied Piper of Hamlin. Moreover, it is felt that because of the knowledge acquired through surveys and studies, we have been able to put into effect a campaign based on sound scientific principles and a fair knowledge of rat psychology and habits.

If the persons responsible for the planning of rat proof construction, its incorporation in buildings, and its upkeep, will be alert, resourceful, determined, and as tireless in their efforts to "build out" the rat as we have found him to prevent his species from becoming extinct, permanent success is assured.

REFERENCE

1 Eskey, C R. An Epidemiological Study of Plague in the Hawaiian Islands. *Pub. Health Bull. No. 213.*

* ["It has thus became possible to state in a general way that the disease known as typhus has two main manifestations—the first and better known is *true typhus*, a louse-borne disease of great communicability from one person to another in times of overcrowding among an unclean population, and characterized by its tendency to the formation of epidemics; the second *(endemic typhus)*, a disease primarily of rodents which is transmitted from rat to man by rat fleas This manifestation of typhus is, seemingly, not transmitted from man to man direct and is therefore characterized by its tendency to remain endemic" *Manson's Tropical Diseases*, 10th ed, edited by Philip H. Manson-Bahr, Baltimore: Wood, 1936, pp. 218–220]

Occurrence of O and H Agglutinins Following Subcutaneous and Oral Administration of Typhoid Vaccine

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THE literature contains many conflicting reports on the agglutinin response following oral administration of typhoid vaccines. Hofstadt [1] and Pyper [2] in agreement with Besredka report excellent agglutinin response following oral typhoid vaccination. Valentine [3] and Tuft [4] report very little, if any, agglutinin response. With this in mind it seemed worth while to make a comparison of the agglutinin response obtained in two groups of healthy students, one group receiving 3 doses of commercial T.A.B. vaccine; the other receiving 3 capsules of typhoral * on 3 successive days, the first dose being preceded by a capsule of dried ox bile.

TECHNIC

Many of the subcutaneous group and all of the oral group were bled prior to the administration of the vaccine. These sera were then tested for agglutinins by mixing them in serial dilutions with an equal amount of H antigen, and a duplicate series was mixed with an equal amount of O antigen.

The first series of tests were run in duplicate using O and H antigens prepared from the Rawlings strain and from a freshly isolated strain of *E. typhi*. After this first series when no differences were observed in the serum titers, the latter strain only was used.

The H antigen was prepared by washing the growth from the surface of a French square with saline containing 0.1 per cent formaldehyde. Enough of this suspension was made to run the tests for the entire series. It was diluted to match a silicate turbidity standard of 500.

The O antigen was prepared according to the method of White.[5] The organisms were washed off in very small amounts of saline; treated with several volumes of absolute alcohol; stirred at 56° C. for 1 hour; left in the refrigerator 4 days, and the bacteria removed by centrifugation and suspended in 50 per cent alcohol. This constituted the stock suspension of O antigen which was diluted to match the turbidity standard of 500 as indicated above.

The serum dilutions were from 1–5 to 1–1,280. The tests were incubated 2 hours at 56° C. and allowed to remain in the icebox overnight after which they were read with a reverse 12X ocular and recorded.

RESULTS

In the first series of 78 students, 26 received the vaccine by the usual subcutaneous method. Fifty-two received

* The typhoral was kindly supplied by the Eli Lilly Company whose coöperation we wish to acknowledge.

TABLE I

Twenty-six Students Inoculated Subcutaneously 4 to 5 Weeks Prior to the Test

	0	*1–10*	*1–20*	*1–40*	*1–80*	*1–160*	*1–320*	*1–640*	*1–1,280*
Antigen O	13	7	4	1	0	0	0	1	0
Antigen H	0	0	0	5	9	7	4	1	0

TABLE II

Fifty-two Students Received Oral Vaccine 4 to 5 Weeks Prior to Test

	0	*1–10*	*1–20*	*1–40*	*1–80*	*1–160*	*1–320*	*1–640*	*1–1,280*
Antigen O	48	0	3	0	0	1	0	0	0
Antigen H	33	1	5	7	2	4	0	0	0

oral vaccine and of these 25 had never received typhoid vaccine nor had had the disease. Among the 26 vaccinated subcutaneously, a preliminary test showed that none had O agglutinins; 2 only H agglutinins in a titer of 1–10. In the oral group of 25, who had never received vaccine, 2 had a titer of H agglutinins of 1–40 before vaccination. Twenty-seven of the 52 oral group had received subcutaneous vaccine 1–10 years prior to the oral vaccination; 19 showed H agglutinins, 3 of these showed O agglutinins. The highest titer given was 1–160. The majority gave titers ranging from 1–10 to 1–40. The results of vaccination in these two groups are tabulated in Tables I and II.

It is very readily seen that the response of H agglutinins to subcutaneous vaccination was marked, none failing to develop H agglutinins although the titers were not high. Thirteen also developed O agglutinins. Since 1 person only gave a titer of more than 1–40, and the majority a titer of only 1–10, this bears out the usual contention that vaccination does not cause the development of somatic agglutinins in large quantity. The 1 person who had a titer of O agglutinins in a dilution of 1–640 gave no history of having had typhoid fever and had never been vaccinated previously. After oral vaccination in the previously unvaccinated group, 23 remained completely negative. Two had a natural titer of 1–40 which did not increase. Of the 27 who had received subcutaneous inoculation prior to oral vaccine, 18 continued negative or showed no increase in titer. In 5 cases the agglutinin titer was doubled and 4 showed an increase of more than double.

A second series of 69 students were given oral vaccine, of these 35 had

TABLE III

Thirty-five Vaccinated Subcutaneously 6 Weeks to 10 Years Prior to Oral Vaccine

	0	*1–5*	*1–10*	*1–20*	*1–40*	*1–80*	*1–160*	*1–320*	*1–640*	*1–1,280*
Antigen O	28	2	3	1	1	0	0	0	0	0
Antigen H	15	1	7	4	4	0	1	0	0	3

TABLE IV

Test Made 4 to 6 Weeks After Oral Vaccine

	0	*1–5*	*1–10*	*1–20*	*1–40*	*1–80*	*1–160*	*1–320*	*1–640*	*1–1,280*
Antigen O	21	4	4	6	0	0	0	0	0	0
Antigen H	10	2	7	5	6	4	1	0	0	0

received vaccine subcutaneously 6 weeks to 10 years prior to the oral vaccine. Table III gives the distribution of the H and O agglutinins in this group before taking oral vaccine.

Table IV gives the distribution of H and O agglutinins in this group of 35 after oral vaccine. Six developed H agglutinins, 1 person having H agglutinins before taking typhoral had no agglutinins in the tests made after oral vaccine. Of the 20 who had H agglutinins before vaccination, 6 showed no increase; 7 showed a slight increase; 7 showed a decrease, and it is worth noting that 3 of these students had been vaccinated subcutaneously only 6 weeks prior to the oral vaccine. This probably represents the natural decrease observed after a lapse of time following subcutaneous vaccination and was not affected by the oral vaccine.

There were 34 students who had never been immunized. The distribution of H and O agglutinins prior to oral vaccine is given in Table V.

glutinins before immunization, 2 showed no rise in titer and 2 showed no O agglutinins after immunization.

Although the figures are not evident in Tables V and VI, 28 had no H or O agglutinins prior to oral vaccination. Of these 28, 17 did not develop agglutinins, 3 developed both H and O agglutinins, 7 developed H only, and 1 developed O only following oral vaccine.

Four persons received a second round of oral vaccine; 3 of these showed no agglutinins at any time. One showed H agglutinins in a titer of 1–10 before the second oral vaccine and 6 weeks later showed the same titer for H agglutinins but now had a titer of 1–20 of O agglutinins.

It will be seen from the above figures that only 24 per cent of the 121 persons who received oral vaccine developed H agglutinins. In this small group the agglutinins were rarely found in dilutions as high as 1–80. The percentage of these persons developing

TABLE V

Never Vaccinated. Tests Made Prior to Oral Vaccine

	0	*1–5*	*1–10*	*1–20*	*1–40*	*1–80*	*1–160*	*1–320*	*1–640*	*1–1,280*
Antigen O	30	1	2	1	0	0	0	0	0	0
Antigen H	32	1	0	0	0	0	1	0	0	0

TABLE VI

Never Vaccinated Prior to Oral Vaccine. Tests Made 4 to 5 Weeks After Oral Vaccine

	0	*1–5*	*1–10*	*1–20*	*1–40*	*1–80*	*1–160*	*1–320*	*1–640*	*1–1,280*
Antigen O	26	5	2	1	0	0	0	0	0	0
Antigen H	19	3	10	2	0	0	0	0	0	0

The results of tests made 4–5 weeks following the oral vaccine are given in Table VI.

Of the 32 who had no H agglutinins prior to oral vaccine, 4 developed both H and O agglutinins, 9 H only, and 2 O only; none giving titers above 1–40.

Of the 30 who had no O agglutinins before oral vaccine, 6 developed O agglutinins. Of the 4 who had O agglutinins was still smaller. In contrast to this, all of the persons who received vaccine subcutaneously developed H agglutinins the majority to final titers of 1–320 to 1–640. This is in agreement with many reports to be found in the literature.

DISCUSSION

The literature on agglutinin response

following the administration of oral typhoid vaccine is very conflicting. Hofstadt [1] reports that 75 per cent treated with oral vaccine gave agglutinin titers of 1–600. She did not test for O and H agglutinins. Dilutions of the patient's serum from 1–12.5 to 1–600 were used. The antigen was a 24 hour broth culture and incubation was at 37° C. for 18 hours. Pyper [2] using live cultures of *E. typhi* O_{901} and H_{901} for his agglutination test obtained the surprising titers of 1–3,000 after oral vaccination. Dennis and Berberian [6] found O and H agglutinins present in dilutions of 1–100 following oral vaccine, whereas after the subcutaneous method the titers ranged from 1–90 to 1–1,450, the titers for O being lower than those for H after subcutaneous vaccination and the reverse after oral vaccination.

On the other hand, Valentine,[3] Tuft,[4] and Achard [7] report no significant increase in agglutinins following oral vaccination. Their results are very similar to those reported here.

There seems to be an increasing number of statistical reports largely in the French literature dealing with the efficacy of oral vaccine in the prevention of typhoid fever. The generally favorable tone of these raises the question as to whether the agglutinin response following typhoid vaccination may be used as a criterion for the immunity of the patient to typhoid fever. It is well known that following an attack of the disease the immunity of the patient persists after the disappearance of the agglutinins. It is admittedly difficult to judge the immunity of a patient from the presence or absence of circulating antibodies. It would seem desirable, however, to try other means of measuring antibody response following oral vaccine and to withhold recommendation of the use of oral vaccine until some better method of measuring its efficiency has been devised.

CONCLUSIONS

The administration of typhoid vaccine by the oral method gave rise to the formation of H and O agglutinins in a small percentage of those vaccinated and only in low titer.

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Tapeworm Infestations in the Southern United States*

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THE widespread and justifiable publicity given to the nematode infestations in southern United States, such as the hookworm and round worm, has tended to obscure the fact that in these same states another class of worms, the cestodes, or tapeworms, is found in a sufficient number of cases to warrant interest in their study. Otto [5] has recently published a report on the incidence of the dwarf tapeworm (*Hymenolepis nana*) in southern United States based on data collected incidental to his ascaris studies, while Keller [6] has reported his findings of rat tapeworm (*Hymenolepis diminuta*) infestations in surveys made by himself and associates in several southern states.

In an endeavor to obtain additional and more complete data on the incidence of tapeworm infestations in the southern states, questionnaires were sent to 13 state board of health laboratories. Replies were received from 11. In order that our information might be as complete as possible and perhaps more representative of actual conditions, the figures available from recent surveys have also been included. As a result we have reports on 927,625 fecal examinations made in 13 southern states (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, and West Virginia), 1931 to 1935, inclusive. These data are summarized in Table I.

In the 927,625 fecal examinations on which this report is based, positive findings for all types of tapeworms total 8,085, making a mean incidence of 0.87 per cent. The incidence in the individual states ranges from 0.29 per cent in Florida to 2.97 per cent in Tennessee. When we endeavor to classify these positive findings as to types, we find available for study only 650,653 examinations (70 per cent) with 7,249 positive findings. In replies to our questionnaires we note such statements as: "We do not keep record in our annual reports of the types of intestinal parasites found"; and, "we do not keep detailed records of our tapeworm findings." Our own records in Georgia, especially of unusual tapeworm findings, have not been as complete as desirable. There is need on the part of the various state board of health laboratories for more careful and detailed recording and reporting of their intestinal parasite findings—especially tapeworm—if adequate and correct information as to prevalence is to be obtained.

* Read before the Laboratory Section of the American Public Health Association, at the sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

TABLE I

Human Tapeworm Infestations in the Southern United States, 1931–1935
(Based on Reports from State Laboratories and Special Surveys)

State		Total Exams.	Total Tapes	Per cent	H. nana	Per cent	T. Sag.	T. Sol.	H. Dim.	D. Latum	D. Can.
Ala.		282,844	2,975	1.03	2,895	1.02	24	..	6	..	..
Ark.	(A)	3,228	58	1.80	28	1.04	..	..	..	..	..
Fla	(B)	274,607	792	0 29	1	0.10	..	..	..	..	..
Ga	(C)	142,707	1,357	0 95	1,334	0.93	12	2	7	1	1
Ky.	(D)	38,388	1,114	2.90	1,095	2.85	8	..	11	..	..
La.	(E)	1,406	21	1.49	21	1.49	..	..	..	..	..
Miss.	(F)	82,867	448	0.54	441	0.53	3	4	..	..	..
N C	(G)	12,168	74	0.61	70	0.58	2	2	..	..	..
S C	(H)	34,476	230	0.67	229	0.66	1	..	..	..	..
Tenn.	(I)	30,146	895	2.97	885	2.94	3	..	7	..	..
Tex	(J)	1,883	27	1.43	27	1.43	..	..	..	..	..
Va.		15,126	74	0 49	68	0.45	5	..	1	..	..
W Va	(K)	7,779	70	0 90	55	1.05	..	..	..	..	..
Total		927,625	8,085	0 87	7,149	1.10	58	8	32	1	1

(A) Includes 545 examinations with estimated 30 unclassified tapeworm findings by state laboratory, and 2,683 examinations with 28 positive *H. nana* findings (1.04%) made by Otto.[5]
(B) Includes 273 859 examinations with 791 unclassified tapeworm findings by state laboratories, and 748 examinations with one positive *H. nana* finding (0.1%) made by Otto.[6]
(C) Includes reports made by 3 city laboratories on 28,394 examinations with 44 positive *H. nana* and 2 positive *T. solium*
(D) Includes survey of 36 counties (1934–1935) made by Keller and Leathers.[1] 23,964 examinations; *H. nana*—654 (2 7%), *H. diminuta*—11
(E) Based on survey by Otto[6] in South Central Louisiana, 1,406 examinations; *H. nana*—21 (1.5%).
(F) Includes survey by Keller and Leathers.[2] 50,733 examinations; *H. nana*—200 (0 39%).
(G) For 1934 and 1935 only
(H) Includes survey by Keller and Leathers.[3] 28,875 examinations; *H. nana*—187 (0 6%)
(I) Includes survey by Keller.[4] 25,192 examinations; *H. nana*—750 (2 9%) *H. diminuta*—7; "*Taenias*"—3.
(J) Based on Upton's[12] findings (1932–1933) in 5 east Texas counties 1,883 examinations; *H. nana*—27 (1 4%)
(K) *H. nana* percentage based on 5,211 examinations with 55 positive *H. nana* (1.05%).

Of the 7,249 positive tapeworm findings 7,149, or 98.6 per cent were the dwarf tapeworm (*Hymenolepis nana*), an average incidence of 1.1 per cent for 13 southern states. The incidence ranges from 0.10 per cent in Florida to 2.94 per cent in Tennessee. In comparison, the Rockefeller Sanitary Commission for the Eradication of Hookworm Disease[7] reported an average incidence of 1.8 per cent dwarf tapeworm infestation, based on 141,247 fecal examinations made during 1913 and 1914 in 11 southern states (Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, North and South Carolina, Tennessee, Texas, and Virginia).

The larger the number of examinations the more representative will be the results obtained. Because of the lack of available information it has been necessary for us to include dwarf tapeworm findings based on a comparatively small number of examinations—Florida 748, and Texas 1,883, whereas a larger number of examinations might have given different results. Some of our data include results obtained from surveys on selected groups such as school children, who generally show higher incidence of *H. nana* infestations than found in adults; and from rural areas where the incidence is usually higher than in urban areas. However, we believe that our results for the several southern states would approximate closely the incidence that might be anticipated from a state-wide survey.

The questions naturally arise as to

why the dwarf tapeworm findings in this study should comprise 98.6 per cent of all the tapeworm findings and why we should find such a low incidence (1.1 per cent). *Hymenolepis nana* is much more easily acquired than are the other tapeworm infestations. This parasite apparently does not require an intermediate host as do the other tapeworms, and human infestation is acquired "as a result of hand-to-mouth transmission of eggs that are in the infective stage when passed from the body." This "ease of acquirement" accounts for the high percentage of dwarf tapeworm findings as compared with the other types. On the other hand, as Keller [2] points out, the eggs of *Hymenolepis nana* have a thin shell, are fragile, and probably cannot resist external environmental conditions—a factor that probably limits the incidence. Also, Otto [5] states that "most human infection with *H. nana* is acquired probably either from transient or more probably from established human strains of the worm as a result of ingesting eggs from relatively fresh human feces" which would also be a factor in limiting the incidence.

Of the 7,249 positive findings, only 100 are for types other than *H. nana*. Among these are:

Taenia saginata (Beef tapeworm)	58
Taenia solium (Pork tapeworm)	8
Hymenolepis diminuta (Rat tapeworm)	32
Diphyllobothrium latum (Fish tapeworm)	1
Dipylidium caninum (Dog tapeworm)	1

There are several reasons for the small number of beef and pork tapeworm infestations reported. These worms require a suitable intermediate host (the pig for *T. solium* and cattle for *T. saginata*). Man usually acquires the parasite through the ingestion of raw or insufficiently cooked meat containing the cysticerci or larvae. Rigid government inspection of most of our beef and pork, thorough cooking, and proper refrigeration which probably kills the cysticerci, are no doubt important factors in limiting human infestations. In computing the incidence of the beef and pork tapeworms based on laboratory reports, we should hold in mind that, while either eggs or segments of the taenias may be found in the stools, most diagnoses are based on the findings of proglottids or segments. The average physician is probably more familiar with the appearance of these worms than with any other (the ascaris excluded). The majority of the positive taenia findings in our laboratory were the results of physicians sending or bringing specimens to us, either for confirmation of their own identification, or merely to acquaint us with the discovery. We believe that many physicians do not call upon the laboratory for aid in identifying the taenias. As a result, laboratory reports possibly show a lower incidence of human infestation than is actually the case.

Diagnosis of the other tapeworm infestations, such as the rat tapeworm, the fish tapeworm, or the dog tapeworm, is usually based on the laboratory findings. The rat tapeworm (*Hymenolepis diminuta*) is reported as having been found in 5 southern states (Alabama, Georgia, Kentucky, Tennessee, and Virginia) with a total of 32 cases. Keller [6] in 1931, reported 8 human infestations with this parasite, 7 found by him and 1 by Otto in surveys made in Tennessee. At that time he stated that "reports of about 100 cases are available." In recent surveys he and his associates found 11 cases in Kentucky.[1] We have found 20 cases since 1922.

These findings lead us to the conclusion that rat tapeworm infestations of humans are probably more numerous than believed. Most of our findings are encountered in the routine examination of fecal specimens submitted by health officers, and many

of the patients fail to show any symptoms, suggesting that many cases go undiscovered. While *Hymenolepis diminuta,* according to Chandler [8] is very common in rats and mice in all parts of the world, the fact that man is infected only under the grossest unsanitary conditions no doubt accounts for the comparatively low incidence of human infestation with the parasite. Direct infestation is not possible, as the parasite requires an intermediate host, the cystercercoid larva being found in the body cavity of a surprising range of meal infesting insects. Joyeux [9] regards the adult beetle, *Tenebrio molitor,* and the rat fleas, *Ceratophyllus fasciatus* and *Xenopsylla cheopsis,* as the natural intermediate hosts of *H. diminuta.* It is probable that most human infestations are due to the ingestion of improperly cooked breads, biscuits, and other foodstuffs made from flour or meal carrying the infected intermediate host. The conditions under which such an infestation can be acquired will be described in the report we are presenting of one of our rat tapeworm cases.

Findings of fish tapeworm infestations have been reported from time to time in this country, especially, according to Barron,[10] in the lake regions of northern Michigan and Minnesota. In the southern states they are rare and only 1 case is reported in this study. Two intermediate hosts and one definitive host are required for the completion of the life cycle of *D. latum,* man acquiring the infestation only through the ingestion of raw or insufficiently cooked fish containing the plerocercoid larva of the worm. Since the dietary habits of our natives do not include the consumption of raw fish, it is natural that infestation is found chiefly among the Jews who "taste the raw minced fish in the preparation of gefüllte fish" and among certain races, such as the Swedes and Finns, who eat freely of raw fish.

Human infestation with the dog tapeworm *(Dipylidium caninum)* is exceedingly rare in the United States and only 1 instance is reported in this study, found in our laboratory. This parasite requires an intermediate host which it finds in the dog louse—*Trichodectes canis,* in whose body cavity the onchosphere develops into the infective stage; or in the dog flea, *Ctenocephalus canis,* and the human flea, *Pulex irritans.* In the latter hosts, infection of the flea larvae occurs by ingestion of the dog tapeworm eggs which do not develop into the cystercercoid larvae until the flea larvae have reached the adult stage.

"Infection in man is entirely accidental and is evidently brought about through food contamination or through the practice of allowing dogs to lick the face at which time the flea is ingested. Infection in man, as well as in other definitive hosts, can only be acquired by swallowing the infected adult flea or louse. The eggs of this worm are seldom seen in the host's feces unless the proglottid becomes disintegrated or broken, and diagnosis is best made from segments passed with the host's feces." [11]

This was the method in the case which we are reporting.

SUMMARY

Nine hundred twenty-seven thousand six hundred twenty-five fecal examinations in 13 southern states from 1931–1935 inclusive, show 8,085 positive tapeworm findings of all types, a mean incidence of 0.87 per cent. Of the 7,249 positive findings which could be classified, 98.6 per cent were the dwarf tapeworm *(H. nana),* an average incidence of 1.1 per cent. Only 100 other types of tapeworms were found in this survey, of which 58 were beef tapeworm *(T. saginata);* 32 rat tapeworm *(H. diminuta);* 8 pork tapeworm *(T. solium)* and 1 each fish tapeworm *(D. latum)* and dog tapeworm *(D. canimum).*

Histories are given of cases of human infestation with the fish tapeworm, the rat tapeworm and the dog tapeworm.

Data regarding the prevalence of human infestations with tapeworm are incomplete due to the failure of a number of state board of health laboratories to classify their findings.

REPORT OF A HUMAN INFESTATION WITH THE FISH TAPEWORM

Our examination of a blood smear submitted for malaria was negative for malaria, but the blood picture showed the red cells varying considerably in size and shape, with numerous cells showing polychromatophilia and basophilic stippling. Nucleated red cells of both the normoblastic and megaloblastic type were present in such large numbers as to suggest a "blood crisis." The differential count showed 67 per cent polynuclears, 31 per cent lymphocytes and 2 per cent eosinophils. A severe secondary anemia was reported with a request for the case history and clinical symptoms.

Patient, a white male, age 45, native of Finland resident in this country for 18 years, living in a community of Finns in south Georgia. Has been farming for 15 years. Illness began about 5 weeks previous. Complained of weakness and a tired feeling; lost about 15 pounds. When first seen he had the appearance of a seriously ill man, yet up walking and going about his home with no complaint except the weakness and continued loss of weight. Marked cachexia and anemia. Hemoglobin, about 30 per cent, pulse—90; temperature—100°; blood pressure, 136/70. Other findings negative. The comment of the attending physician was "You will note from the above that the physical findings so far do not warrant a diagnosis. The man's general appearance though would indicate a malignancy or some condition of the blood stream which is upsetting the blood picture."

Two facts were considered suggestive: (1) the severe anemia found, and (2) the patient was a native of Finland. These suggested the possibility of a fish tapeworm infestation so a request was made for additional blood smears and a fecal specimen.

The blood smears showed essentially the same picture as reported, while the fecal specimen showed numerous ova of *D. latum*. One week later the patient was hospitalized. Blood gave 2,300,000 red cells; 8,900 white cells; hemoglobin, 35 per cent. He was treated with oleoresin of aspidium according to the method outlined by Magath and Brown.[13] Approximately 22.2 meters (74 feet) of fish tapeworm proglottids and 11 heads were recovered. Only one additional fecal specimen could be obtained following treatment and this was negative 2 weeks after treatment. The red cells still showed a fairly marked variation in size and shape with numerous megalocytes and an occasional megaloblast. The blood picture was now comparable to that found in pernicious anemia.

Further information secured from the patient and members of his community suggests the possibility of the infestation having been acquired prior to the patient's entry into this country. Studies to determine the possible presence in the community of other cases has not been attempted.

REPORT OF A HUMAN INFESTATION WITH THE RAT TAPEWORM

History (taken from the hospital charts):

White, female, age 28 months. Started passing worms (described by the Mother as "flatworms") June, 1935, ranging in size from 2 to 10 inches. The family lived in a house that had many rats and mice and rat feces often found in the flour. Mother sifted the flour and if feces was found the flour was discarded. However, the child ate biscuits made from this flour. They moved from this house in July, 1935. The child continued to pass segments for about 2 months accompanied by some fever, but no nausea or vomiting, no diarrhea or constipation. There was no more trouble until March, 1936, when the child again had fever and was given "Castoria" after which she passed 1 worm about 10 inches long. Fecal specimens submitted to the State Department of Health Laboratory were found positive for *Hymenolepis diminuta* on March 9 and April 6. Hospitalized on April 9. Blood at this time gave red cells 4,480,000; white cells 10,650; hemoglobin, 80 per cent. Dif-

ferential count polynuclears, 40 per cent; lymphocytes, 57 per cent; juveniles, 3 per cent. On April 11 the patient was treated by the method suggested by Magath and Brown,[13] using an emulsion of oleoresin of aspidium. All stools for 48 hours were collected in a weak formalin solution and sent to the State Department of Health Laboratory. There were found two pin worms, numerous *H. diminuta* ova and approximately 105 cm. (42 inches) of *H. diminuta* segments, the latter as individual proglottids and chains from 2 to 5 inches in length. Stool examinations on April 17, May 9, July 24, and September 25 were negative. Specimens from the Mother and Father examined April 6 were negative.

REPORT OF A HUMAN INFESTATION WITH THE DOG TAPEWORM

In view of the widespread distribution of the dog tapeworm *(Dipylidium caninum)* in dogs and cats, and the close relationship that frequently exists between these animals and children, it is somewhat puzzling that more cases of human infestation with this worm are not reported.

CASE HISTORY

The patient was a white male, age 4 years, a resident of Atlanta, Ga. He was carried to the family physician on account of a respiratory infection. The mother reported that during the past month she had noticed small white worms in the child's stools. The child was in good physical condition and had suffered only from an occasional "spell" with his stomach. Stool examinations failed to reveal any ova. Ten days later, several segments of worms were passed and were identified at the State Board of Health Laboratory as the dog tapeworm. Two days later the patient was treated with pelletierine tannate. Approximately 154 cm. (61 inches) of strobilia and 6 heads were recovered. Fourteen different chains were studied, varying in length from 3 to 23 cm. The largest had approximately 65 proglottids, with a maximum breadth of 2 mm. Subsequent to treatment 2 stool examinations were negative for ova and no segments have been found during 3 years.

This patient was the proud owner of a small puppy which had the usual flea population. The child played with the dog constantly, loved, petted, and handled it. Later the puppy had "running fits" and was left in the country, thus removing from the child's presence the dog, the fleas, and the tapeworm larvae.

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NOTE: The authors wish to express their appreciation to the directors of the various state laboratories who kindly furnished data regarding their examinations; to Drs. A. E. Keller, W. S. Leathers, and G. F. Otto for valuable assistance, and to Drs. M. Hines Roberts, Atlanta, Ga., T. G. Ritch, Jesup, Ga., and the Egleston Memorial Hospital, Atlanta, Ga., for case histories.

Influence of Dead Bacteria on Microscopic Counts of Pasteurized Milk

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WHEN one examines a stained smear of pasteurized milk under the microscope, bacteria which exhibit a variety of forms are frequently encountered. These may resemble the flora of raw milk or may be forms found rarely except in pasteurized milk.

There is a widely held belief that bacteria killed by pasteurization, remain visible and are counted, along with those remaining alive after the heating. This view is regarded as justification for restricting microscopic counts to raw milk.

HISTORICAL

The original publication by Breed dealing with direct microscopic counts of bacteria in milk, occurs in the *Centralbl. f. Bakteriol.*, II Abt. Bd. 30, 1911, pp. 337–340. Later publications on the subject by Breed and his associates occur in the following mentioned publications of the New York Agricultural Experiment Station, Geneva, N. Y.: *Tech. Bull. No. 49; Bull No. 439; Tech. Bull. No. 119; Bull. No. 566; Bull. No. 571; Tech. Bull. No. 156;* and *Tech. Bull. No. 191.* In these publications one may trace the development and gradual change in ideas about the problem of dead bacteria in connection with microscopic counts of pasteurized milk. The latest of the publications mentioned in the foregoing, on p. 20, contains this statement by Breed: "Bacteria in pasteurized milk that stain well in methylene blue are usually found to be alive."

In the publications mentioned, only one describes the appearance of dead bacteria and illustrates them. On this account it is reviewed here.

Robertson, Yale, and Breed [1] point out that there occur in samples of pasteurized milk, large, rod-shaped, spore-forming bacteria which do not form colonies on agar plates. The same organisms were found in milk stone, the material cooked on to pasteurizing equipment. Those writers at first thought that the organisms were thermophiles and made experiments planned to test this supposition, but the results did not reveal them. The writers conclude that the rod-shaped bacteria found in the pasteurized milk originated in the milk stone, and had been killed by pasteurization. Plate I in the bulletin under consideration, depicts spore-bearing thermophilic bacteria, but they were not recognized as such when the bulletin was published.

The conclusion that the bacteria were dead was erroneous, as shown by later work at the New York State Agricultural Experiment Station. Partly because of temperatures used in the experiments, and partly, perhaps, due to difficulty in growing the bacteria in agar, they had narrowly missed recognizing thermophiles. The bulletin had pointed out the important fact that bacteria occur in milk stone. It soon

became evident that they were thermophiles, and that milk stone is a common source of these organisms in pasteurized milk.

The bulletin in question is of particular interest because it represents a transition stage in the attitude of the workers at the New York State Agricultural Experiment Station toward the problem of bacteria in pasteurized milk. In the first publication on the microscopic method cited in the foregoing, a feeling of hopefulness about the value of microscopic counts of pasteurized milk is expressed. Later publications discuss the problem of whether certain organisms in pasteurized milk are dead, or bacteria that will not grow on agar. The doubt about the condition of the bacteria occasionally seen in pasteurized milk was again shown, when the method was included in *Standard Methods of Milk Analysis* of the American Public Health Association and limited to raw milk.

The reason for the doubt becomes more clear in the light of the information that some time after the first publication cited, workers generally encountered high microscopic counts in pasteurized milk. The true explanation of the presence of these bacteria had to be delayed until the occurrence of thermophiles in pasteurized milk was recognized.

Notwithstanding its title and conclusions, the bulletin being reviewed, marked the beginning of a series of reports on studies of thermophiles, which has been of outstanding value in making clear their peculiarities. In the later work the microscopic method was employed extensively in the study of the bacteriology of pasteurized milk.

Standard Methods, sixth edition, published in 1934, does not limit the use of the microscopic method to raw milk as in earlier editions. On page 28 it is recommended "as a means for detecting in pasteurized milk the presence of thermophilic and other types of bacteria that do not grow on standard agar plates." On page 36 the preparation and examination of microscopic specimens is again recommended for the detection of thermophilic bacteria. Here also, is reference to stainable bacteria as evidence of the necessity of remedial methods.

METHODS EMPLOYED

The problem was studied by making counts of raw milk, of the same after pasteurizing, and after holding for long periods at pasteurizing temperature. The method of laboratory pasteurization in test tubes was employed.

At the expiration of the several time intervals the tubes were removed and shaken before the smears were made. Counts were made from smears prepared with a loop delivering 1/100 c.c.

The senior author has unpublished data concerning counts from smears prepared from milk measured with a pipette and a loop. The results warrant the use of the latter, which permits more rapid work.

The slides were dipped in xylol and dried. Then, Newman-Lampert stain No. 2 was dropped on the smears. After the stain dried they were rinsed in water and dried, when they were ready for examination. Xylol was used to prevent the accumulation of fat in the double purpose stain when slides were dipped in it.

Counts were computed from the average number of single bacteria, rather than clumps, found in 100 fields, with a microscope adjusted to a factor of 600,000. When large numbers of thermophiles were encountered, a lesser number of fields were counted, in some cases, only 25 fields.

RESULTS

Microscopic counts of bacteria were made, in August, 1933, of 7 samples of raw milk, of the same after labora-

tory pasteurization at 142° to 143° F. for 30 minutes, and after holding at the same temperature for a total of 90 minutes. The counts are recorded in Table I in columns designated by the number of minutes that the milk was held. The percentages of reduction of the counts of the heated milk as compared with the original raw count are entered in columns at the right of those showing counts at the termination of the two heating periods.

TABLE I

Microscopic Counts and Percentage Reductions Before and After Holding Market Milk 30 and 90 Minutes. Temperature 142–143° F.

Sample No.	*Raw per c.c.**	*Held 30 Min. per c.c.**	*Per cent Red.*	*Held 90 Min. per c.c.**	*Per cent Red.*
1	2,300	420	81.7	18	99.2
2	2,600	600	76.9	30	98.8
3	5,100	1,100	78.4	270	94.7
4	1,400	120	91.4	24	98.2
5	2,700	260	90.4	72	97.3
6	4,200	120	97.1	150	96.4
7	3,800	440	88.4	36	99.0

* Expressed in thousands

It will be observed that pasteurization reduced the microscopic counts by percentages varying from 76.9 to 97.1. The counts from the same samples after holding for 90 minutes showed reductions that varied from 94.7 to 99.2 per cent, much higher percentages than observed after holding for 30 minutes, excepting only sample No. 6, which yielded inconsistent results.

In February, 1936, we conducted a similar experiment with raw milk used by another pasteurizing plant in Detroit. In this case, the heating was prolonged until the appearance of rod-shaped thermophilic bacteria was noted and their multiplication became apparent. This prolonged heating was carried out to gain information about the length of time of holding at pasteurizing temperature necessary to make thermophiles detectable under the microscope. Furthermore, the presence of thermophiles which are common in pasteurized milk, introduced evidence of importance in discussing the subject of dead bacteria in pasteurized milk.

Five raw milk samples taken from tank trucks were used, and the results appear in Table II. The letter T is used as an abbreviation for the expression: rod-shaped thermophilic bacteria, usually referred to as thermophiles. To economize space, observations on thermophiles are recorded in the column headed Per cent Red., but refer to the count in the column at the left. The abbreviation of Per cent Red. refers to percentage of reduction as compared with the count of the raw milk.

Counts were limited to 100 fields, and in a number of cases no bacteria were found in this number of fields, in several samples of milk after heating from 1.5 to 2 hours. In the smears that contained considerable numbers of thermophiles, less than 100 fields were counted, the number of fields counted being determined by the number of thermophiles.

In cases where significant figures were obtained for counts at the 30 minute and 1 hour periods, the per cent reduction was uniformly higher at the end of the latter period. These results confirm those recorded in Table I.

Several inconsistencies in counts result from limiting the search for bacteria to 100 fields, and from the presence of clumps of bacteria.

TABLE II

Microscopic Counts Before and After Holding Market Milk for Intervals up to 5 Hours. Temperature 142–143° F.

Hrs. Held	Sample 1 Count per c.c.*	Per cent Red.	Sample 2 Count per c.c.*	Per cent Red.	Sample 3 Count per c.c.*	Per Cent Red.	Sample 4 Count per c.c.*	Per cent Red.	Sample 5 Count per c.c.*	Per cent Red.
(Raw)	1,800		12	...	650	...	1,200		4,000	
½	24	98.6	0†	100	670‡	0	70	94.1	150	96.2
1	0†	100.0	0†	...	0†	100	12	99.0	12	99.7
1½	36	98.0	0†	...	0†	...	6	99.5	0†	
2	0†		0†	...	0†	...	36	97.0	60	⅓ T
3	1 cl.	T	0†	...	60	No T	70	No T	12	No T
4	800	T	150	T	180	No T	890	T	580	T
5	5,500	T	7,500	T	6,000	T	7,000	T	9,000	T

* = Expressed in thousands
† = No bacteria found in 100 fields
‡ = Caused by one clump

It will be seen that after the 30 minute period, the several samples yielded minimum or no counts until thermophiles began to appear.

Thermophiles appeared after 2 hours' holding of sample 5, but in such limited numbers that they were missed in the count at 3 hours. In sample 1, one clump of thermophiles was found after 3 hours. Only after holding for 4 hours, were thermophiles consistently present in all samples. After 5 hours the rapid increase of thermophiles was evident.

These counts were made with a minimum number of fields counted and demonstrate that the bacteria increased in numbers and therefore were not dead.

In February, 1936, counts were again made from raw milk and of the same milk after holding for various periods. The samples represented raw milk used by three milk plants.

In the case of the previous experiments the samples had been collected in ½ pint bottles, machine-washed in the plant, and kept in ice water. In this experiment a more refined technic was used. The samples were taken in sterile Erlenmeyer flasks of 250 c.c. capacity. The milk was either drawn into them directly from a valve or was added with a sterile pipette. The flasks

TABLE III

Microscopic Counts Made from Market Milk Before and After Holding for Intervals up to 7 Hours. Temperature 142–143° F.

Hrs. Held	Sample 1 Count per c.c.*	Per cent Red.	Sample 2 Count per c.c.*	Per cent Red.	Sample 3 Count per c.c.*	Per cent Red.
(Raw)	1,400		30	...	540	
½	900	35.7	0†	100	42	92.2
1	18	98.7	0†	...	12	97.7
2	64		12	...	0†	
3	0†		0†	...	780	T
4	100	Part T	0†	...	8,300	T
5	3,200	T	12	T		
6	9,200	T	440	T		
7	12,000	T	7,300	T		

* = Expressed in thousands
† = No bacteria found in 200 fields

were placed in a water bath for pasteurizing the milk and holding for longer periods. Results appear in Table III.

Pasteurizing in flasks proved to be more inconvenient than test tubes because of the problem of keeping the flasks immersed. There is nothing in the results to indicate the necessity for using the technic employed.

In two instances where significant figures for percentage of reduction are available, holding for 1 hour eliminated more bacteria than the 30 minute holding period.

Thermophiles appeared in sample 1 after 4 hours' holding, in sample 2, after 5 hours, and in sample 3 after 3 hours. Smears of sample 3, after 4 hours' holding, showed very high counts of thermophiles. Here again the counts were made from as few as 25 fields and no high degree of accuracy of counting was attempted.

On December 26, 1935, an experiment was conducted to demonstrate the gradual disappearance of bacteria heated during the pasteurizing process and longer. To provide high count milk for the work, a small amount of cream was added to high grade pasteurized milk with the low microscopic count of 12,000. The pasteurized cream employed had originally shown no bacteria in 100 fields but bacteria had grown in it while standing at 40° to 50° F. in a refrigerator until it showed a very high count.

The material was pasteurized in the laboratory at a temperature kept most of the time at 143° but with fluctuations between 142° and 144° F. Smears for counts were made of the milk before heating, when the temperature reached 143° F. and at intervals of 5 minutes for a total of 90 minutes.

The results for the first 45 minutes are given in Table IV.

Columns are provided to show the period of heating, reckoned from the time the milk reached 143° F., the number of fields counted, the microscopic counts, and the per cent of reduction of the count as compared with the count of the raw milk.

It should be noted that the warming period before pasteurization was regarded as commenced, consumed 7 minutes and caused a 40 per cent reduction in count. The count after a 5 minute interval is the only one that does not reveal a consistent gradual reduction in count during the first 45 minutes of heating. Thirty minutes

TABLE IV

Microscopic Counts from Inoculated Market Milk at 5 Minute Intervals During Holding for 45 Minutes. Temperature 142–144° F.

Min. Held	*Fields Counted*	*Microscopic Count * per c.c.*	*Per cent Red.*
Raw	25	30,000	..
143°	25	18,000	40
5	25	20,000	33
10	25	16,000	46
15	25	15,000	50
20	25	10,000	66
25	25	7,100	76
30	25	3,900	87
35	100	1,400	95
40	100	1,300	95
45	100	590	98

* = Expressed in thousands

brought about a reduction of 87 per cent. On further heating the destruction was consistently greater up to 45 minutes, when the percentage of reduction was 98. Following the 45 minute period, the figures displayed minor inconsistencies with fluctuations in percentage of reduction between 95 and 99 per cent.

Toward the end of the 30 minute period, and especially noticeable after this, were poorly stained cells, which were regarded as dead and were not counted.

The percentages of reduction after heating for 30 and 90 minutes were similar to those shown in Table I.

SUMMARY AND DISCUSSION

Heating milk at pasteurizing temperature for 30 minutes caused a considerable reduction in the number of bacteria found in smears stained with methylene blue. In many cases the percentage of reduction in count would appear to be comparable to similar figures obtained from plate counts. In general, the reduction after 30 minutes range from 75 per cent upward, with 9 of the 16 samples showing above 90 per cent reduction.

Most of the bacteria found after the 30 minute heating disappeared after the longer heating. It would seem that they were merely live organisms that had survived ordinary pasteurization, a group of bacteria that is well recognized as a factor affecting efficiency of pasteurization. The longer periods of heating at 60 and 90 minutes, in the several tests, produced percentages of reduction in most cases above 95 per cent.

It is evident that pasteurization not merely kills most of the bacteria commonly present in large numbers in raw milk, but renders them invisible when stained with methylene blue, if indeed it does not disintegrate them. The extent to which bacteria totally disappear under the influence of heat is the striking circumstance encountered in making microscopic counts of pasteurized milk, as attested by the figures for percentage of reduction in the foregoing tables. In our routine work in making counts of pasteurized milk clumps of organisms or chains of streptococci that apparently illustrate the effect of heat are only occasionally encountered. A few well stained cells appear, accompanied by others faintly stained and others distinguishable but not stained. The poorly stained cells were especially noticeable in our last experiment. Making such counts does not necessitate frequent decisions about the thoroughness of staining. The comparatively rare instances where damage is made evident by poorly stained cells are regarded as demonstration of that process rather than evidence of serious disturbance of the accuracy of the count.

The practice of regarding well stained cells as live ones, as recommended by Breed, seems sufficiently accurate for the purpose of using microscopic counts in quality control work.

As shown by the results just presented, the idea that the direct microscopic method could not be used in counting bacteria in pasteurized milk, can hardly have been based on nonthermophilic bacteria which survive and were stained after pasteurization. This belief is supported by an experience of over 4 years in which microscopic counts have been used as a basis for controlling the quality of pasteurized milk.

On the other hand, thermophiles could readily have given rise to such an idea. In the early days of the study of these rod-shaped bacteria, when they were not recognized as thermophiles, a failure to cultivate them would suggest the conclusion that they were dead. This we believe is the explanation for the prevalence of the idea that dead

bacteria seriously interfere with microscopic counts made on pasteurized milk.

Since thermophiles constitute a problem of major importance in producing pasteurized milk of low bacterial content, microscopic counts are essential for effective control work. Their use avoids the two problems associated with standard plate counts, which are the subject of discussion at present. These are: How to provide a suitable incubator temperature and a culture medium for growing the bacteria, and revealing the facts about the bacterial content of milk.

CONCLUSION

Our results justify the belief that insufficient numbers of dead bacteria remain visible after pasteurization to impair the usefulness of direct microscopic counts made on pasteurized milk.

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Insulin Treatment of Mental Disease Introduced in State Hospitals

THE insulin treatment of dementia praecox, discovered by the young Viennese physician, Manfred Sakel, is now in use in state mental hospitals throughout New York and also in some other states.

Only recently emerged from the experimental stage, this treatment has already benefitted a considerable number of cases previously considered hopeless. It consists essentially in the production of a series of daily shocks with gradual increasing doses of insulin. The insulin after being injected into the patient exhausts the sugar content of the body and produces a state of somnolence or coma, and in some cases, convulsions. After passing into a coma, the patient is revived by the feeding or injection of a glucose solution.

* * *

Dementia praecox is the most prevalent form of mental disease. In New York alone there are over 36,000 cases of dementia praecox in the state mental hospitals. Offering, as it does, hope of the return of many of these men and women to normal social life with a vast saving to the state, the insulin shock treatment holds dramatic possibilities.—*Health News*, Albany, N. Y., June 28, 1937.

A Venereal Disease Program for State or Full-Time Health Departments*

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THE success of a venereal disease control program depends upon certain fundamental factors which are enumerated in the order of their importance: (1) adequate funds, (2) experienced personnel, and (3) reliable information concerning the extent of the problem.

With these 3 factors present we may discuss seriously a venereal disease control program. When they are not present, or cannot be provided, it is a waste of time and breath even to mention such a program.

I have placed "adequate funds" as the first factor because funds must be available to employ experienced personnel, and without experienced personnel to collect information there can be no reliable data.

Whether it is a venereal disease program or a house we are building there is always that very important underlying principle that the measure of success depends upon trained workers and organization. Let us assume funds are available, trained personnel is at hand. The first step is to get some reliable information. We want facts, not impressions or anyone's guesses.

(A) CENTRAL OFFICE

Let us start our investigations in the central office.

1. What are the rules and regulations of the state board of health concerning V. D. control measures?
2. Is there a special division for V. D.?
3. Is there a full-time experienced V. D. control officer in charge?
4. What appropriations were made for the V. D. division last year?

(B) NOTIFICATION

1. How many cases of syphilis were reported by physicians last year? How many cases of gonorrhea?
2. What type of reports are made? Does the physician simply report a case of syphilis or gonorrhea, does he follow some standard of classification, or does the law require only the reporting of communicable cases?
3. What per cent of physicians report V. D. cases?

(C) FREE CLINICS

1. What free clinics are available for the treatment of indigents?
2. Where are these clinics located?
3. Are these clinics supported by state, city, or private funds?
4. Personnel of clinics—
 Well organized and staffed?
 Poorly organized and staffed?
5. Records—Investigate how kept—
 Good?
 Poor?
6. Type of service—
 Good?
 Poor?
7. "Follow-up" System—
 How performed—nurses, social workers or police?
 Results of follow-up service?
8. Is consultation service available?
9. Hospital facilities—
 Adequate?

* Read before the Western Branch, American Public Health Association, at the Eighth Annual Meeting in Phoenix, Ariz., April 13, 1937.

Inadequate?

10. How many cases of syphilis were treated in hospitals last year?

11. How many of these cases were early syphilis?

12. What is the average amount of treatment the early cases actually received?
Number of doses of arsphenamine?
Number of doses of heavy metal?

13. What per cent of these cases discontinued treatment before they had received 20 doses of arsphenamine and 20 doses of heavy metal?

14. How long does the average case of gonorrhea remain under treatment?

(D) LABORATORY SERVICE

1. Is free laboratory service for serological tests available to private physicians?

2. How many examinations were made in last year for syphilis? For gonorrhea?

3. What per cent of examinations are reported as positive for syphilis? For gonorrhea?

4. Is it possible to tell from the laboratory records how many of the specimens sent in for examination are for diagnosis and how many for treatment control?

5. What type test is used and how reliable are the laboratory reports?

6. Does laboratory check their results with other laboratories to detect possible laboratory errors?

7. What appropriations are made to laboratory?

8. Are darkfield services available? How obtained and method used?

(E) DISTRIBUTION OF DRUGS

1. Does the state board of health offer free drugs for treatment of the indigents?
For all cases?

2. How are these drugs distributed? Through druggists or by mail from central office?

3. What drugs are distributed?
Arsphenamine?
Neoarsphenamine?
Tryparsamide?

4. Number of doses of each drug distributed in last year?

5. Cost of drugs?

6. Cost of distribution?

(F) HOSPITAL FACILITIES

1. What facilities are available in hospitals and lying-in institutions for routine serological service?

2. What facilities are available for the same service in prenatal clinics?

3. Do hospitals accept V. D. cases?

4. Is a routine serological examination mandatory on all patients?

5. Is treatment instituted at hospital?

6. What provisions are made for patient after patient leaves hospital?

7. What about investigation to uncover sources of infection and exposures?

8. Has hospital an out-patient department?

9. If so, what fees are charged?

(G) PROSTITUTION

1. What police measures are attempted to control prostitution?

2. Are there laws regulating such houses? How well enforced?

3. Are all suspected prostitutes examined for venereal disease?
Before conviction?
After conviction?

4. If found infected, are such women required to take treatment?

5. What control has the health officer over such cases?
Quarantine measures?

6. If patient is sent to prison or reformatory are treatment measures provided?

7. Is there a parole system?

8. Are hospital facilities available for infected prostitutes? If so, where?

(H) INDUSTRY

1. What efforts have been made to control syphilis and gonorrhea in industry?

2. Is a physical examination necessary before applicant for employment is accepted?

3. If found to be infected, is the applicant rejected?

4. If employee is found to be infected is he discharged?

5. Is treatment furnished by industry or is patient sent to private physician or clinic?

6. What educational measures have been used in industry?

7. Are the industrialists interested and will they coöperate?

(I) EDUCATIONAL MEASURES

1. What educational measures have been used?

2. In schools?

3. For civic organizations?

4. Social hygiene?

5. Lectures?

6. Movies?

7. Posters?

8. Pamphlets?
9. Placards?

(J) PROPHYLACTICS

1. Is the sale of prophylactics prohibited?
2. Where sold?
 Drug stores?
 Filling stations?
 Cigar stores?
3. Is there a special license necessary to sell or display such articles?
4. Is any attempt made to protect the public from purchasing an inferior grade of these products? Are there certain standards demanded?
5. Are there any laws or regulations prohibiting the advertisement of such prophylactics?
6. Do physicians and clinicians instruct their patients in the proper use of prophylactics?

(K) GENERAL

1. What is the attitude of the medical profession toward a proposed V. D. control program?
2. What coöperation may be expected from the clinics and hospitals?
3. What coöperation may be expected from the lay groups?

Now, these are questions that must be answered before we can think in terms of planning a V. D. control program.

How can this information be obtained? (1) By a questionnaire, (2) personal investigation, or (3) by records? On these we must depend and on these only.

Someone will say, "We cannot get adequate funds. We have no trained personnel and have no reliable data." To that I can only reply, "Use whatever funds you have to train personnel, then use the personnel to collect reliable data; then build your organization."

One reason we cannot get adequate funds is because we have no reliable information nor sufficent trained help to get it. And the longer we wait or the more we temporize or accept makeshift and temporary programs, the further we will be from our goal.

On several occasions I have been invited into a state to discuss a V. D. program with the health officer. Sometimes, before I could get my bags unpacked at the hotel a committee would call upon me to outline the program. They might just as well ask me to be a magician and pull a rabbit or two out of my hat, or make a bowl of goldfish disappear through the floor.

It is obvious that no one can plan a program of any kind unless he knows exactly what material he is expected to use. Anyone can outline a program or suggest one, but a paper program will not control these diseases.

How easy it is to say "Control prostitution." But no one has succeeded. It is just as easy to say, "Get the carrier"—perfectly simple until you try it yourself.

Another simple statement is "Keep the communicable cases under treatment." That's good advice, yet only a small percentage of physicians and clinicians have been able to accomplish this. You as practical health officers know these difficulties, yet progress is being made and will be made if we keep the 3 fundamental principles in mind —adequate funds, trained personnel, and reliable information.

School Nursing in a Generalized Nursing Program*

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IN presenting this subject an effort has been made to include the advantages and disadvantages experienced in administering school nursing in a generalized public health nursing program. Twenty-one questionnaires were sent to official public health nursing agencies of the larger cities. Nine replies were received, 7 of which stated that they did include school nursing in such general programs as they offer, but only 2 include all the services of a complete health program, while 2 have no generalized program of any kind. Of the 7 departments doing school nursing, 5 included public and parochial schools, and 2 included parochial schools only.

The replies stating the advantages of generalized nursing sound almost stereotyped because there is such general agreement. Summarized they read:

First—More information regarding the individual child, the family, and the district is available for use by the teacher, and by the nurse.

Second—Duplication is eliminated in the home and elsewhere, and wiser teaching results because it is done by one nurse rather than by several.

Third—Effort, carfare, and time are saved by the reduction of travel. One director states as an additional advantage the continuous access which the school principal has to the district supervisor in the health center.

In the Detroit Health Department, school nursing exists as a specialized nursing service in certain sections which represent 35 per cent of the city population and 46 per cent of the staff. The generalized nursing program includes 65 per cent of the population and 54 per cent of the staff. This dual situation exists because the city does not have available buildings for taking over a generalized service in the areas not yet covered. Generalized nursing in Detroit includes every possible health service excepting daily bedside care of patients.

ADVANTAGES

Local experience has shown the following definite advantages of a generalized nursing service:

1. An appreciation by the nurse that the child's health and welfare must be considered in the light of the entire family situation. His importance in the family is relative and his personal hygiene and behavior depend largely upon the home situation. If the family income is limited, relative importance must determine what physical defect or health condition in the family shall receive first attention.

2. The prevention of communicable diseases demands that parents be taught not to expose the community by send-

* Read at a Joint Session of the American Association of School Physicians and the Public Health Nursing Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

ing into it members of the family who have symptoms of communicable disease. The success of a public health nurse is not measured by the number of individuals she sends home because of symptoms but by the number of individuals whose communicable disease is discovered before they leave home. Adequate morning inspection at home by the parent will keep communicable diseases out of the school. A study was made of all communicable diseases found by nurses in the school and in the home during March, April, May, and June, 1936. Specialized nurses found 56.6 per cent of the communicable diseases in their area in the home and 43.4 per cent in the school, whereas the generalized nurse found 65.5 per cent in the home and 34.5 per cent in the school.

3. A maximum of community health requires consideration of the child's health and welfare before he enters school. Immunization and the correction of physical defects are matters that should be attended to in the home before the child enters school. As an example, in September 1935,* 67 per cent of all entrants to school had already received their immunization treatments against diphtheria.

4. The school experience of the child with problems may be less difficult after the nurse informs the interested teacher about his whole family situation.

5. The success of a public health nurse is not measured by the number of children she treats in the school clinic but by the number who come to school with clean cloths or dressings put on by mothers who have learned to take on their own responsibility for minor injuries or by physicians from whom they have sought care. The elimination of treatment clinics, except for emergencies which are used for teaching, releases more of the nurse's time for family work.

6. It is easier under the generalized plan for the nurse not to serve as a truant officer.

7. The visit to the school by the parent can be utilized for discussing other family problems, and every visit by the nurse to the home can be used to reinforce the health teaching in behalf of the school child.

8. The child missed in the family visit can be seen in the school.

9. The mother knows that if she needs her nurse she can find her in the school, or she can send a message by the school child.

10. Communicable disease is better controlled. The school nurse, because she is also the communicable disease nurse, knows of the new cases of communicable disease in the school sooner than if she had to wait for reports, as the specialized nurse does. The generalized nurse also knows of the other cases of communicable disease in the district as well as the school children. She can be on the alert for symptoms and see that her teachers are also. During the 1935–1936 school year nurses in the specialized district discovered 31 per cent of the total cases of major communicable diseases among school children. In the generalized districts nurses discovered 37 per cent of the total cases of major communicable diseases among school children, an increase of 6 per cent.

11. In some families, foreign especially, the nurse who comes from the school can be more easily understood and accepted. This is an aid to all the family's problems.

12. The special health facilities of the school system, such as open air rooms, can be used much more intelligently by the nurse who knows the entire family health history of the pupils including cases of tuberculosis

* 1935 figures are given because those of 1936 are not yet available.

and convalescence from acute communicable diseases or other special health problems.

13. The generalized nurse can often eliminate unnecessary absentee calls, because of her knowledge of the families. Instead of taking time to visit the home where she knows the mother always gives her children the necessary care and calls the physician early, she can make the visit where the children are more likely to be neglected.

14. The generalized nurse is better prepared to care for emergencies in the home, some of which would have to wait until another specialized nurse in the particular field could make the call.

15. More nurses become familiar with school work, and when a special occasion arises they can be called upon for school work. For the last few years, such a very special occasion has been the first 2 school days in September when a minimum of activities other than school work has been carried out. This releases more nurses to meet personally every new pupil and the parent who accompanies him to school. The child's physical condition is the subject of this interview. Medical examinations are not made by the Health Department until the second month of school. By calling upon all nurses in the department who know school work, it was possible last year to double the usual staff for these 2 days. This additional help made over 5,500 home visits unnecessary. At $.77 per visit this meant a saving of $4,300.

16. With the protection of the health of the school child considered as one of the tenets of the National Education Association, the teaching of health by integration with other subjects becomes the teacher's task. This makes class teaching by nurses in the grades less and less necessary and thus reduces even more the time profitably spent in school. By the same token, the daily morning inspection and even the yearly inspection of children become matters of great importance and even personal concern to the conscientious teacher further releasing the nurse and increasing her opportunity to teach the mothers in the home.

17. A great advantage is found in the increased amount of work done. In a study of home visits made in 1934–1935 the specialized nurses were 1.4 per cent short of their quota according to their enrollment. The generalized nurses' home visits were 1.4 per cent higher than the standard for their enrollment—actually an increase of over 4,000 visits. While the specialized nurses had more teacher-nurse conferences, the generalized nurses had more teacher-parent-nurse conferences and nurse-social worker conferences. The specialized nurses had more group conferences with mothers but the generalized nurses reached 3.8 times as many individuals in their extra home visits.

The nurse is not responsible for determining when a correction is a correction but she is responsible for seeing that children obtain the services of their family physicians. One way of measuring results is to compare the number of children in the generalized and specialized districts who were actually taken to physicians by their parents for physical examinations, and from whose physicians reports of the examinations were returned to the school. Where nursing was generalized, physicians' reports were returned for 31.9 per cent of the school children, where specialized, 32.8 per cent. Although the generalized is 0.9 per cent less efficient in this regard, this is not cause for disappointment because it can be readily understood.

The economic conditions are poorest in the generalized districts and they contain the greatest number of foreigners, who are largely Polish. Forty-five per cent of the school children are

estimated to belong to indigent families. This is a matter of importance because there are virtually no free clinics in Detroit where a health examination will be given to an indigent school child. During the time covered by the study, there were practically no facilities available to indigents for the correction of dental defects, but there were facilities for the correction of visual defects. Although the generalized area includes 64 per cent of the school population only 47 per cent of the total dental corrections were obtained through the efforts of generalized nurses, whereas the visual corrections rose to 70 per cent.

The 4 months' study shows that the generalized districts which had 64 per cent of the total school population obtained 64 per cent of the total corrections of physical defects and 65 per cent of the pupils who reached the private physician were sent by generalized nurses.

DISADVANTAGES

The following disadvantages were given by the 4 departments answering:

1. It was not possible to report each morning at the sub-station.
2. An inadequate number of nurses is more keenly felt under a generalized program.
3. Better prepared, more intelligent nurses are necessary for generalized service, and they are not always available.
4. There is an occasional conflict between the school schedule and urgent field work.
5. "The attitude sometimes encountered among the school principals is that the school nurse should spend all of her time in the school building while school is in session."

It is questionable whether an acknowledged inadequate number of nurses, or a staff of poorly qualified nurses should be condoned under either system. Nurses are expected to advise and to stimulate teachers in regard to their health program—they must necessarily be their equals in education and cultural background under either type of nursing organization. The system that would show up an inadequate quantity or quality of nursing service should be adopted for that very reason, and as such should be classified under the "advantages" column.

The above criticism of the school principals occurs also in the Detroit situation, and it is the result of insufficient effort on the part of the health departments to acquaint the school personnel with the larger community problems, for which both the school and the health department have a responsibility.

That there is occasional conflict between the school schedule and urgent field work is true, but so likewise are there conflicts under any specialized service. As examples, assistance in the baby clinic at the same time that a formula has to be demonstrated, assistance in the tuberculosis clinic the same morning a patient must be prepared to go to the hospital, 2 scarlet fever calls of equal importance, or in the schools, 2 teachers who want their visits made "first thing in the morning." An emergency nurse should be provided for such occasional conflicts regardless of which type of nursing service is functioning. No system can be planned which eliminates all conflicting responsibilities.

There seems to be but one well justified criticism offered—the need for specialized supervision—but why this should be considered a disadvantage is not clear unless it be considered a budget difficulty. Health Departments usually include or try to include in their personnel medical specialists to head up the several divisions, each of which serves the whole city. The corresponding divisions of nursing service need

just as careful handling. Not only is the work of the individual nurse of importance to the specialized supervisor but the needs of the community are as well. It must be someone's responsibility to see each activity city-wide in its application. As long as the conclusions reached by the specialists are eventually tied up in one well balanced health program, they are an advantage in any department.

The principles and policies underlying any program have much to do with its success. Modern health conceptions include the following:

1. The family as a unit is more important than any of its members. Isolated individuals cannot be handled adequately.
2. Prophylactic work brings best and most economical results when applied to the infant and preschool child.
3. The physician-family relationship must be protected and promoted for the best interests of the family and of the health movement.
4. The teacher is an important factor in the promotion of child health and community health.

These health principles are promoted best where the family as a unit, in the light of all its health needs, is the core of the system and this means generalized, one-nurse-per-family health work.

But perhaps of greater importance than the type of system under which the nurse functions is the kind of nurse and the quality of her work. Once an organization has defined its objectives, the health commissioner must know whether his nursing staff is prepared to carry them out. Neither the new nurse nor the nurse longer in service who has not learned the contents of the approved certificate course in public health nursing and had properly supervised experience is adequately prepared. We only deceive ourselves when we do not face these disagreeable facts. An unprepared nurse can bring to naught either system, but she can do the greatest harm in the generalized field because it offers at all times the maximum of opportunities for community service.

Consumer Contracts Undulant Fever, Milk Dealer Held Liable

IN a decision profoundly affecting the milk industry, Superior Judge James T. Lawler of Seattle, Washington, ruled that milk distributors and milk producers are liable for the purity of their products. Judge Lawler's decision on April 26 awarded Ralph Dean $1,946.50 damages for contracting undulant fever. Both the milk company distributing the milk and the farmer on whose farm the milk was produced were defendants in the case. Mr. Dean charged that he contracted the fever from drinking raw milk.—*The Milk Dealer* (*Health News*, Albany, N. Y., June 28, 1937).

Influence of Contaminating Bacteria on the Results of the Microscopic Test for Streptococcic Mastitis*

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THE microscopic examination of properly collected and handled milk samples is an accurate means of diagnosing streptococcic mastitis in dairy cows. Details of the microscopic test have been presented elsewhere.[1] As the territory from which milk samples were received became larger, the time required for transportation became longer. This presented a problem of spoilage due to bacteria in the milk other than streptococci. Brilliant green in final dilution of 1–50,000 in the milk was found to preserve the samples for weeks if reasonable precautions had been taken in collecting them.[2] The samples are incubated at 37° C. for at least 12 hours during which time the streptococci multiply and are more easily detected by microscopic examination. It is evident that contaminating bacteria get into the milk as a result of improper technic in collecting the samples, or may be present in the udder and reproduce during the period of incubation. As a result they may be present in such large number as to obscure the streptococci when present in small numbers. Metabolic products of the contaminating bacteria may inhibit the growth of the streptococci.

This study was undertaken to determine the effect of such contaminating bacteria on the efficiency of the microscopic test for detecting streptococcic mastitis, and to determine the effect of temperature and time of holding samples at different temperatures prior to incubation.

METHODS

Milk naturally infected with streptococci was inoculated with increasing amounts of the organisms found to contaminate milk samples most frequently, which included strains of *Escherichia coli*, *Staphylococcus aureus*, *Bacillus subtilis*, *Brucella abortus*, and an udder micrococcus. These tubes together with a control (no contaminating bacteria) were incubated at 37° C. for 12 hours. A similar series was prepared, and 0.1 c.c. of a 1–500 sterile aqueous solution of brilliant green was added to each tube of milk (10 c.c.) giving 1–50,000 final dilution. The tubes were incubated at 37° C. for 12 hours, after which Breed's smears were prepared of all tubes and examined microscopically. The presence of streptococci and the number of chains and the approximate number of contaminat-

* *Journal Article No. 282*, new series of the Michigan Agricultural Experiment Station.

ing bacteria per microscopic field were recorded. Three additional sets of tubes of streptococcus infected milk were contaminated with *Esch. coli;* one set was immediately incubated for 12 hours at 37° C., a second was held at ice box (7° C.) temperature for 48 hours prior to incubation, while the third was held at room temperature (24° C.) for 48 hours prior to incubation at 37° C. for 12 hours. Brilliant green in final dilution of 1–50,000 was added to 3 similar sets of tubes of streptococcus infected milk; these were subjected to the same temperatures and conditions as the series with no dye. Microscopic findings were recorded.

RESULTS AND DISCUSSION

The conditions of this study were varied to simulate procedures followed in laboratories making routine microscopic tests of milk samples for streptococcic mastitis. The organisms contaminating milk samples most frequently were employed. These get into the milk samples through faulty technic in collection, such as: failure to wipe the udder with a moist cloth, failure to discard the first stream of milk from each quarter, failure to milk directly in sterile tubes, as well as contamination of the cork while collecting the sample. *Br. abortus* and *Staph. aureus* may invade the udder and be eliminated in the milk. They may overshadow the microscopic field and decrease the possibility of finding the streptococci, especially when few are present.

To determine the influence of the contaminating bacteria on the accuracy of the microscopic test, 10 c.c. amounts of milk naturally infected were inoculated with increasing amounts of broth culture of the contaminating organisms. These tubes with a control were incubated at 37° C. for 12 hours. The results are presented in Table I. The *Esch. coli, Staph. aureus,* and *B. subtilis* reproduced rapidly. Coincident with the increase of these bacteria there

TABLE I

The Microscopic Examination of Natural Streptococcus Infected Milk with No Dye and with 1–50,000 Brilliant Green to Which Varying Amounts of Contaminating Bacteria were Added and Then Incubated at 37° C. for 12 Hours

Amount of Contaminating Bacteria Added to 10 c.c. of Strep. Infected Milk c.c.	E. Coli	Strep.	S. aureus	Strep.	Br. abortus	Strep.	B. subtilis	Strep.	Micro-coccus	Strep.
	Microscopic Examination of Milk Samples (No Brilliant Green)									
none	..	35*	..	28	..	30	..	35	..	33
0.1	m†	3	m	28	l	32	m	20	l	33
0.2	m	3	m	30	l	30	m	10	l	34
0.3	h	1	h	25	m	26	m	12	l	34
0.4	h	1	h	20	m	24	m	12	l	32
0.5	h	2	h	15	m	26	h	10	l	32
	Microscopic Examination of Milk Samples (1–50,000 Final Dilution of Brilliant Green)									
none	..	40	..	44	..	38	..	45	..	45
0.1	l	44	l	42	l	42	l	43	l	45
0.2	l	42	l	44	l	38	l	40	l	48
0.3	l	38	l	40	l	40	l	34	l	46
0.4	l	36	l	35	l	35	l	28	l	45
0.5	m	24	l	36	l	35	m	24	l	45

† l = up to 100, m = 100, h = over 1,000 bacteria per microscopic field.
* The number of streptococcus chains per microscopic field.

was a marked decrease in the number of streptococcus chains. The *Esch. coli* exerted the greatest detrimental effect on the accuracy of the test, since only 1, 2, or 3 chains of streptococci were present per microscopic field as compared with 35 chains per field in the control. The presence of the *Br. abortus* and the udder micrococcus did not greatly influence the multiplication of the streptococci. It is therefore important that bacteria not present in the udder be kept out of milk samples without brilliant green dye if an accurate diagnosis of streptococcic mastitis is to be made.

A second series of samples was set up, using another milk naturally infected with streptococcus to which was added 1–50,000 final dilution of brilliant green. This series was examined after incubation at 37° C. for 12 hours. In each case, reproduction of the added bacteria was reduced. Only when large numbers of contaminating bacteria were added to the milk did the number of streptococcus chains per microscopic field decrease. This decrease did not imperil the accurate diagnosis of any sample since at least 20 chains of streptococci were present per microscopic field when the largest number of contaminating bacteria was added, while in the case of *Esch. coli*, where no brilliant green was added, the streptococci were hard to find. Many times only 1 chain was present per microscopic field. Therefore, if few streptococci are present in the original sample and it becomes contaminated with *Esch. coli* as a result of faulty technic in collection, the microscopic diagnosis may not be accurate. The microscopic examination would not reveal the presence of the streptococci because of the crowding effect of the contaminants, or because of inhibitory products of metabolism of the contaminants. The presence of 1–50,000 brilliant green is essential in milk samples submitted for routine test to insure an accurate microscopic diagnosis of streptococcic mastitis.

In routine testing for streptococcic mastitis the milk samples are subjected to different conditions in temperature and time prior to delivery at the laboratory or prior to testing. Since contaminating bacteria influence the accuracy of the examination when tested immediately following collection, the question was raised concerning the effect of such bacteria on the diagnosis when considerable time elapsed before testing, and the influence of the holding temperature during that time on the

TABLE II

The Microscopic Examination of Natural Streptococcus Infected Milk Containing Brilliant Green in Final Dilution of 1–50,000 to Which Varying Amounts of Esch. coli Were Added and Then Subjected to Different Holding Times and Temperatures Prior to Incubation

Amount of Esch. coli Added to 10 c.c. of Strep. Infected Milk	Microscopic Examination of Milk Samples (1–50,000 Brilliant Green)					
	Incubated at 37° C. for 12 Hours		7° C. for 48 Hrs., then Incubated at 37° C. for 12 Hours		24° C. for 48 Hrs., then Incubated at 37° C. for 12 Hours	
c.c.	Esch. coli	Strep.	Esch. coli	Strep.	Esch. coli	Strep.
None	..	50	..	47	..	52
0.1	1	48	1	49	1	43
0.2	1	40	1	49	1	39
0.3	1	37	1	40	m	32
0.4	m	34	1	35	m	27
0.5	m	30	m	31	m	24

accuracy of the results of the microscopic test. To study this, tubes of naturally infected milk containing 1–50,000 brilliant green were inoculated with increasing amounts of *Esch. coli*. One set of tubes with a control was incubated at 37° C. for 12 hours and examined immediately; another set and a control were held at ice box temperature (7° C.) for 48 hours; while the third set and a control were held at room temperature (24° C.) for 48 hours. The results are shown in Table II. In each case the presence of *Esch. coli* in the milk decreased the number of streptococcus chains found per microscopic field. This effect was greatest when the samples were held at room temperature (24° C.) for 48 hours prior to incubation. The explanation may be that room temperature permitted the *Esch. coli* to reproduce, while the streptococci reproduced slowly if at all. When these samples were incubated at 37° C., the coli, already present in large numbers, reproduced more rapidly than the streptococci thereby crowding out the streptococci.

If milk samples are improperly collected and contaminating bacteria gain entrance the test should be made as soon as possible. Brilliant green in 1–50,000 final dilution should be added to each milk sample, thus inhibiting many of the contaminants and decreasing the reproduction of others so that their presence will not greatly influence the accuracy of the results of the microscopic test for streptococcic mastitis. As the period of incubation is increased beyond 12 hours at 37° C. in the presence of contaminating bacteria, the accuracy of the microscopic test for detecting streptococcic mastitis decreases.

SUMMARY

Contaminating bacteria, that may gain entrance to milk samples as a result of faulty technic in collecting the samples, decrease the accuracy of the results of the microscopic test for detecting streptococcic mastitis. *Esch. coli, B. subtilis,* and *Staph. aureus* in decreasing order alter the accuracy of the results of the microscopic test.

Placing 0.1 c.c. of a sterile 1–500 aqueous dilution of brilliant green into each tube prior to collecting a 10 c.c. sample, gives a final dilution of 1–50,000 brilliant green in the milk. This dye greatly inhibits these contaminants, thereby increasing the efficiency of the test if such bacteria are present. It is essential to use proper technic in the collection of the milk samples, so that contaminating bacteria do not gain entrance and to be sure that the streptococci present did not get in from sources outside the udder; and in addition the dye should be added as a preservative to inhibit the bacteria that may invade the udder and thereby be present in the sample.

Bacteria other than streptococci that may be present in the udder and therefore present in the milk sample do not greatly interfere with the accuracy of the microscopic test for streptococcic mastitis, since the reproduction of the streptococci is only slightly reduced in their presence. *Br. abortus* and udder micrococci are of this type. The presence of 1–50,000 brilliant green in the milk inhibits these bacteria so that no effect is noted, in the accuracy of the test, in their presence.

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THE SIXTY-SIXTH ANNUAL MEETING OCTOBER 5–8, NEW YORK CITY

THE extensive scientific program of the Association's Annual Meeting, to be held in New York City for the first time in 17 years, was published in the August *Journal*.

Important as is this annual review and preview of what has happened, is happening and will happen in our profession, which the Section and General programs cover so well, there are many other concomitants to a convention of the American Public Health Association which are equally stimulating. There is the attending body of convention activities—the entertainment events, the scientific trips, the scientific and technical exhibits, the Health Education Institute, the motion picture program, Health Education and Publicity Headquarters, the American Public Health Association Book Exhibit—to a description of which space is given elsewhere under suitable headings. Beyond all these things which can be enjoyed, seen, appreciated, and studied are the intangibles. Chief among the non-concrete is what can be described only by the word "atmosphere." The atmosphere at an American Public Health Association Annual Meeting is created largely by the delegates themselves. A convention, perfect in its planning, its arrangements, its conduct, can be a dead thing or very much alive depending upon the spirit, the interest, the enthusiasm for a common cause which those who attend contribute to it. The members and guests who attend the Annual Meeting of the American Public Health Association possess those qualities in large measure and also the ability to transmit the seriousness of their own high purpose to others.

That rarest of human attributes, enthusiasm, is abundantly present at an Association meeting. No one who has ever sat through a meeting that extended long beyond the official hour for closing, and seen the reluctance with which

discussions finally came to an end, could possibly doubt that here are people talking shop not because they must but because they want to. With other things beckoning, they voluntarily remain because what they are doing and saying are the things closest to their hearts. That is the true enthusiasm permeating all the convention activities, sometimes to the dismay of the management which must occasionally eject zealous laggards almost by main force.

There are other elements in this "atmosphere." One is contagion—an advantageous contagion. Lowered spirits, discouragement, frequently the sense of failure, are offset by the very physical presence of vivid and successful personalities. Their staunchness, their stability, their psychological attitudes are communicable.

Then there is the comforting consciousness, further contributing to this "atmosphere," that here we meet as equals in an intense community of interests. Young and old, those who have arrived and those who will some day arrive, men and women, the important and the obscure—all are professionally and socially leveled off by the magic of singleness of purpose.

Finally, people have a "good" time at meetings of the American Public Health Association. Many of them admit it, others recognize it only subconsciously, but there is undeniably an air of sociability, of geniality, of good fellowship, which characterizes these annual gatherings. This is far removed from the back-slappings and boisterousness that have become almost synonymous with conventions. Indeed, the cities and hotels that have entertained the American Public Health Association have commented again and again upon the dignity and decorum that prevailed throughout. But mutual regard and respect, genuine pleasure at renewing old and making new acquaintances, a satisfaction in a quickened tempo of living for a few days, these emotional emanations are all but visible and help to make our "atmosphere."

With this introduction, the Local Committee for the 66th Annual Meeting in New York City, October 5–8, and various other Committees responsible for the comfort and diversion of the 4,000 delegates expected, invites you to turn to pages 946–954 and read specific details about other aspects of the Annual Meeting more substantial and less difficult of description.

BOVINE TUBERCULOSIS

BOVINE tuberculosis continues to be an economic problem in every part of the world. The possibility of infection of human beings by the drinking of milk from tuberculous cattle is now acknowledged everywhere and is one of the very great reasons for insisting on the pasteurization of milk, though protection against other diseases is also obtained. In the last few years the prevalence of undulant fever has been emphasized, and in this we have another strong argument for the universal pasteurization of market milk.

From time to time we have called attention to the studies of human tuberculosis derived from bovine sources. In place of the teaching held for so many years that the manifestations of bovine tuberculosis in human beings were confined to the glands, bones, and joints, we now know that a not insignificant number of those so infected show pulmonary tuberculosis. The latest report [1] that has come to our notice concerns a most unusual occurrence in which in a Swedish rural community, 50 persons, mostly children, suddenly showed signs of tuberculosis. An open case of human pulmonary tuberculosis was suspected and

sought for, but none found; and 166 persons, of whom 134 were school children, were tested with tuberculin. Of those giving a positive reaction practically all had been supplied with raw milk from one dairy of 22 cows which was selling unpasteurized milk and justifying it by the claim of veterinary control over the herd, in spite of the fact that some of them gave positive tuberculin tests, but showed no "clinical" signs of what the veterinarian considered "an infectious form of tuberculosis."

Finally the cows were subjected to individual milk tests and one which had been passed as free from tuberculosis by two veterinary surgeons was found to have a mastitis which resembled the usual type due to streptococcus. However, the milk teemed with tubercle bacilli. This cow was slaughtered and found to have tuberculosis of the lungs as well as of the udder. Three other cows of the 22 were found to have pulmonary tuberculosis. Of the 50 infected persons in the outbreak, 25 gave more or less violent reactions, some suffering from erythema nodosum, some from enlargement of the cervical glands, and still others from a high and persistent fever.

We concur in the opinion of the reporter of this outbreak that it teaches a clear lesson which should hardly need repeated emphasis; namely, that if raw milk is given to children, a clinical examination of the milch cows, even by the most skillful veterinary surgeon, is not sufficient. Tuberculosis of the udder is apt to develop quickly and run an acute course which, however, may escape detection in the living animal. Not only should milch cows have the tuberculin test, but all market milk should be pasteurized, and this applies even to what we know in this country as certified milk.

REFERENCE

1. Stahl, S. An Epidemic of Tuberculosis Caused by Milk Infection. *Nord. Med. Tid.*, Vol. 13, 1937, pp. 121–125.

PASTEURIZATION IN ENGLAND AND AMERICA

PASTEURIZATION of *all* market milk is now generally recognized by health and medical authorities, by most of the dairy industry, and by a substantial proportion of the people of this country as an *essential* public health measure. In England, on the other hand, pasteurization has received much less wide recognition, although this desirable procedure is strongly advocated by leaders in the British medical and public health professions, who have frankly stated that the quality of their national milk supply is "unsatisfactory." [1]

The process of pasteurization was introduced in the United States more than half a century ago.[2] Its adoption was slow for about 2 decades, but after 1910 it made fairly rapid progress, especially in our larger cities. Today, it is estimated that about 88 per cent of the milk supplies in all cities of over 10,000 population is pasteurized, and that a similar proportion of our market milk comes from tuberculin tested cattle.

The amount of pasteurized milk varies, of course, in different parts of the country, being highest in the northeastern and middle Atlantic states, and lowest in the south central sections. The general average is also raised by the largest cities, such as New York, Chicago, Detroit, Cincinnati, Boston, and Philadelphia, where more than 99 per cent of the supply is now pasteurized. In London, about 90 per cent of the milk is pasteurized,[3] and in Glasgow, 85.4

per cent is submitted to "some form of heat treatment before delivery," although only 36.5 per cent is pasteurized by holding processes that are licensed.[4]

In our smaller communities the situation is, unfortunately, much less propitious, since only about 39 per cent of the milk supplies in American municipalities of 1,000 to 10,000 population is at present pasteurized. In cities of 5,000 to 10,000 population, about 50 per cent of the milk is pasteurized, while only 40 per cent is safeguarded by this means in the 2,500–5,000 population group, and only 23 per cent in communities of less than 2,500. In this large number of small places, only 5 per cent have reported that all milk is pasteurized, whereas in 43 per cent of these municipalities, no milk at all is pasteurized.[5] These figures indicate that market milk in our large cities is much safer than in the rural sections of the country.

About 2 years ago health officers and physicians hailed with satisfaction the adoption of permissive pasteurization for certified milk.[6] Although the application of this beneficial process to our highest grade of milk has been gratifying in one or two cities, notably Boston and Chicago, its increase has been disappointing in New York and many other cities. Certified milk, valuable as it is, constitutes of course only a relatively small proportion of the milk supply, but even it is not too sacrosanct to benefit from pasteurization, and more of it should be pasteurized.

Consumption of pure milk in the United States is considered by authorities on nutrition to be about one-half as great as it should be in the interests of optimum nutrition, but even so it is approximately 3 times as high as is milk consumption in Great Britain. In that country there has recently been considerable agitation for the wider use of milk, but medical authorities have pointed out that the first and most important procedure is to provide the British people with clean and safe milk, made partially safe by tuberculin testing of cattle and other measures to assure freedom from disease in dairy animals, and completely safe by universal pasteurization.[1]

Recent investigations at the National Institute for Research in Dairying at Reading, in Great Britain, have confirmed the fact that pasteurization has no appreciable effect upon the excellent nutritive qualities of milk.[7] There is no change in the nutritional availability of the calcium and phosphorus nor in the true digestibility of the nitrogen; and neither vitamin A nor its precursor, carotene, is damaged. There is a slight loss of vitamin B, and about 20 per cent destruction of vitamin C if the milk has been exposed to light before heating.

These studies show, says an editorial in the London *Lancet*,[8] "that milk suffers no damage by pasteurization that is important, compared with the risks of drinking it raw." That is an axiom that can be heartily and enthusiastically endorsed for general application in this country. *Raw milk, whether in England or America, should no longer be permitted to impede public health progress.*

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1. Edit. Tuberculin-tested Milk. *Brit. M. J.*, Apr. 10, 1937, p. 814.
2. Tobey, J. A. History of Pasteurization. *Milk Dealer*, May, 1937, p. 52.
3. Corres. Pasteurization of Milk. *Lancet*, Dec. 13, 1930.
4. Edit. Compulsory Pasteurization for Glasgow. *Brit. M. J.*, May 1, 1937, p. 926.
5. Report: The Milk Business in Communities with Populations of 1,000 to 10,000. *Milk Plant Month.*, Mar., 1937, p. 38.
6. Edit. The Pasteurization of Certified Milk. *A.J.P.H.*, Aug., 1935.
7. *Milk and Nutrition.* Part I: Effect of Commercial Pasteurization on the Nutritive Value of Milk, as Determined by Laboratory Experiment, 1937. Natl. Inst. for Res. in Dairying. Reading.
8. Edit. Is Pasteurization Harmful? *Lancet*, May 15, 1937, p. 1179.

PUBLIC HEALTH EDUCATION*

You are invited to contribute specimens of printed matter and other materials for display at Health Education and Publicity Headquarters. See below for details.

You are invited to call, again and again, at Health Education and Publicity Headquarters in the Pennsylvania Hotel during the Annual Meeting in October.

Health Education and Publicity Headquarters—At the Annual Meeting, A.P.H.A., in October, a space 18 by 60 feet will be devoted to school and adult health education, with chief attention to the latter.

A few yards away will be the all day movie theatre; not far distant will be the scientific exhibits; and spread over the mezzanine and in the ball room and elsewhere will be found the technical exhibits.

Printed Matter and Other Materials for Display—Whatever can be incorporated in the classified portfolios should be sent in September to the chairman of the committee, Evart G. Routzahn, Health Education Headquarters, 130 East 22d St., New York, N. Y. This would include selected copies of anything printed, mimeographed, or otherwise duplicated.

Scrapbooks, Exhibits, etc. — All such material should be shipped direct, prepaid, to Pennsylvania Hotel. *But please be sure to write in advance to the chairman* (as noted in preceding paragraph) to get full and final instructions.

Please do not expect to be given space if you have not made advance arrangements. Space is too limited, and plans must be made for the use of the space before the exhibits are placed. Disappointment and serious inconvenience would result if any one failed to report proposed exhibits in advance.

Movies Both Amateur and Professional—Announcement is made elsewhere with the Annual Meeting information that an all day motion picture theatre will be located in the Pennsylvania Hotel. It is expected that during the 4 days of the convention, from 9:00 A.M. through the day on the hour a picture or other projection material will be shown in accordance with the schedule in the official program. Early correspondence is important if any one has a film to be shown and to be scheduled in the program.

1937 Early Diagnosis Campaign—From month to month the *Bulletin* of National Tuberculosis Assn. has published facts and figures showing the wide extension of Early Diagnosis Cam-

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N.Y.

paign in 1937. In quantity and quality it seems to have surpassed all other health campaigns. We were not able to record here the nature of the materials offered, and the plans outlined. This information was available through the state tuberculosis associations, and was not given out by the National Tuberculosis Assn. direct to nationally circulated periodicals.

Why Do We Need Health Education?—Here is one answer from the *New York Times* (July 1, 1937):

Tappan, N. Y., June 30—Rather than submit his pet Jersey cows, Molly and Sylvia, to tests by the state for the eradication of bovine tuberculosis, Robert Gibson, lawyer, ordered them shot. The animals were dead this morning when veterinarians, acting on orders from Albany and backed by state troopers, arrived at Mr. Gibson's home here to conduct the tests.

Mr. Gibson, who is a native of Virginia, said today, "these tests are unreliable and fostered by the milk trust to do away with all privately owned cows."

"In company with Senator Carter Glass, whom I count among my friends, I am opposed to them," he explained. "The new legislation is beyond the attempts of Stalin, Hitler, and Mussolini. I felt that it was time somebody did something of a drastic nature to fight this new Tuberculin Test Law. There are other laws that are taking our freedom away. They, too, should be fought."

Where They Learn About Health or Disease—An intensive newspaper and radio campaign in Detroit, was followed a few weeks later by an effort to check the sources of information about tuberculosis.

The question was asked as to whether the family knew anything about the antituberculosis campaign in the city, and if so, their source of information.

The information sources where reported were as follows: radio, 147 . . . newspapers, 93 . . . regular Department of Health nurse visits, 20 . . . special Department survey nurse visits, 501 . . . other miscellaneous sources, 38 . . . a total of 826, one for each of the families. Dr. Bruce H. Douglas adds that the families lived in "an area of very low economic status where there are relatively few radios, and where newspapers are not read very extensively."

One wonders that some of the 826 had not heard of the campaign from more than one source. If there were such cases how was a selection made for the record? Was the record based on the report of one member of the family? And it would be interesting to know how the answers were secured. What question (or questions) were asked? It is not an easy job for a visitor to get accurate information.

Thirteen Uses for Broadcast Material—If you have broadcast a health talk and let it go at that, you may have overlooked a half dozen to a dozen other uses for that same material.

For details of what has been done with non-health material see "Catalogue of Educational Radio Script Exchange," issued *free* by Office of Education, Washington, D. C.

See under "Thirteen Uses for Script Materials" how different cities have carried out the following:

Scripts are broadcast by high school groups over local radio stations and are criticised by high school listener groups.

Scripts are broadcast as features over educational radio stations.

Scripts are produced by the professional production staffs of commercial stations as sustaining programs.

Scripts are used in "mock broadcasts" over sound systems in schools.

Scripts and supplementary materials are used in connection with courses of instruction in journalistic writing.

Scripts are used in junior college speech classes.

Community groups produce "mock broadcasts" at community meetings.

Script materials are used in adult classes studying education by radio.

Scripts are broadcast over C.C.C. camp sound systems.

Materials are used in libraries for reference purposes.

Scripts are used by institutions for the blind.

The instances quoted refer to broadcast scripts supplied by the Office of Education, but the examples should click into ideas for the wider use of the better grade of health broadcast material.

Diabetic Education — In "Some Aspects of the Management of the Diabetic Patient," by W. R. Campbell:

The diabetic education of the patient should be as broad as he is capable of assimilating. Better coöperation may be expected from a patient who can understand the value of and reasons for therapeutic measures. Only for the few is this plan undesirable since, with comprehension of their problems, there comes a knowledge of how to combat them and an interest in attaining to the best results. A simple primer or guide book is best to start with, supplemented by explanations graded to the individual. Later, some diabetics will become omnivorous readers of all available diabetic literature.

—*Canadian Public Health Journal,* 105 Bond St., Toronto, Ontario.

Nine Point Syphilis Control Program—As outlined by Dr. Thomas Parran (*Journal A.M.A.,* July 17, 1937) the ninth point or principle is:

The public educational program must be persistent, intensive, and aimed especially at those individuals in the age groups in which syphilis is most frequently acquired.

Distillers Are Getting Scared—A new channel for safety education:

It will be a long time before a more revealing advertisement appears than that which "The House of Seagram" inserted in the daily papers last week. Thousands of dollars were spent by this distillery to warn the public, in scarehead type: "We who make whisky say: 'Drinking and driving do not mix!'" Without cost to the Seagram company we reproduce a considerable part of its advertising copy: "This statement may seem to work directly against our self-interest. But actually it does not. It is very much to our self-interest to see that the privilege of drinking is not abused. It is to our interest to see that liquor is consumed as it should be consumed. Whisky is a luxury and should be treated as such. . . . Neither whisky nor any other alcoholic liquor has any place at the wheel of an automobile. Drinking and driving do not mix. This conviction must be shared by everyone who reads the newspapers and by every thinking person who drives a car. . . . If you expect to be at the wheel of a motor car, we say to you: 'Think before you drink! Don't drink before you drive!'" No inside knowledge of conditions in the liquor industry is needed to understand what must have caused the publication of this remarkable warning. As the horror of the national highway massacre mounts, and the part which liquor is playing in this slaughter is borne in on the public mind, the distillers begin to see a day of retribution close at hand. Something must be done, and done quickly, or to save its own life an aroused public will take drastic regulatory measures. Hence this Seagram warning which is as much appeal as warning. After the appeal fails to accomplish its purpose—as it surely will—one wonders what the distillers' next move will be.

In *Christian Century,* 440 S. Dearborn St., Chicago, Ill., July 14, 1937. *15 cents.*

The King's Example—Not alone will be our Canadian readers in their interest in the paragraphs we quote from an article in *Health,* 105 Bond St., Toronto, Ontario, June, 1937 (*15 cents*):

The growing realization throughout the British Empire of the importance of good health will be stimulated into greater action, on all fronts, by the reign of His Majesty, George VI.

No other movement has ever had more sincere patronage than health has had from our new King, and the example he has set to his subjects, unquestionably, will arouse the active interest of leading men and women throughout the Empire.

In the biography of George VI, published in the Coronation Number of the *London Times,* the following paragraph will bring

encouragement to all interested in the great war against disease:

"As president of the British Empire Cancer Campaign he has been indefatigable in his efforts to promote the progress of research; and, after the death of King George V, many of the presidencies of hospitals formerly held by the Prince of Wales were accepted by the Duke, who devoted a great deal of his time during the months which followed in visiting each in turn."

The English Have a Book—A book of a type much needed for the United States and Canada as illustrated by *Health Education Year Book, 1937–8,* issued by Central Council for Health Education, 1, Thornhaugh St., Russell Square, W.C. 1, London, England. 5s. 6d. Orders may be sent direct, or through the A.P.H.A. Book Service.

This cloth bound book lists a wide range of health organizations, and organizations issuing some form of health education material. What they do, and the health education material they offer is given in detail.

There are classified lists, printed matter, periodicals, plays, posters, exhibits, slides, motion pictures, and speakers. Introductory paragraphs suggest uses and opportunities for various materials.

What Do They Like Best?—Good publicity for camps and other summer projects may result from collecting food choices and other preferences of the campers.

The Children's Welfare Federation (325 E. 38th St., New York, N. Y.) gathered answers to widely diverse questions from camps accommodating thousands of boys and girls in 1936. Especially striking was the second choice of spinach as a favorite vegetable of the boys.

The form of the questions and the way they are presented to the children may affect the validity of the answers. We hope that some bright health educator will devise a plan for making the questionnaires useful in spreading information.

Why Not Use More Postal Cards?—Both for economy, and for quick, direct delivery of health messages more use might be made of postal cards or post cards. In addition to the back for business or for health education, the left half of the address side may be used for either business or education.

A "postal card" is the government card, one cent covering postage and cost of the card. A "post card" is a privately printed card of approximately the same size and weight as the government card. You pay one cent postage and buy the card in addition.

Without handwriting, except for the address, a card larger than the postal card may be used.

Health Education in Great Britain—"Annual Report" of Central Council for Health Education, 1, Thornhaugh St., Russell Square, W.C. 1, London, England, describes and illustrates the activities of an organization quite different from anything in this country. What seems to be lacking is a well defined program of health education, in contrast with a program of health education activities. Recognition of this lack is implied in the announcement of a National Public Health Campaign Committee which is to state the need and to formulate a plan.

Health Education in Books—A third book on popular health education is out according to announcement by W. B. Saunders Company, Philadelphia, Pa.

Health Education of the Public is "a practical manual of technic" by W. W. Bauer, B.S., M.D., director, Bureau of Health and Public Instruc-

tion, American Medical Association, and Thomas G. Hull, director, Scientific Exhibit, American Medical Association.

Another book on popular health education is well under way, and yet another one is coming along. We will be starting our own "five book shelf."

"Tell It With Exhibits"—A 16 page, mimeographed pamphlet with this title, written by Mary Swain Routzahn, issued by Social Work Publicity Council, 130 E. 22d St., New York, N. Y. *35 cents.*

The current vogue of welfare expositions prompted the publication. Written broadly for social welfare agencies, the application to public health is frequently obvious, especially when health agencies participate in a general welfare show.

The Health Officer—This publication of the U. S. Public Health Service, Washington, D. C., quotes liberally (April, 1937) from a conference of the English Central Council for Health Education.

The June, 1937, issue includes:

Venereal Disease Information increases circulation . . . Federal Art Projects produces posters for local health department . . . "Pulitzer citation for New York *Daily News* venereal disease campaign" . . . How would you answer this one? (sample of misinformation).

Hygeia, August, 1937—Published by A.M.A., 535 N. Dearborn St., Chicago, Ill.:

Hay fever and weeds . . . In conditioning . . . What does the heart murmur say? . . . It's ice cream—and there's sauce for it . . . Sympathetic inflammation (of the eye) . . . Diabetic gangrene . . . The truth about acidosis (notwithstanding the advertisements, it's not common, and it's not due to diet) . . . Bad habits in good babies (crying, thumb sucking, etc.) . . . The tuberculosis of today (a radio talk) . . . Florence Nightingale (as a human being) . . . Mad dog! (told to a small boy) . . . Animals of destiny (and what they do for and to mankind) . . . Odd oriental cures (picture page) . . . "Doctor, what dentifrice shall I use?" . . . Contact glasses (for the eyes) . . . Is Mary's back straight? (and what to do about it) . . . Rabies ("a plea for conquest through coöperation") . . . Health resorts (points for picking one) . . . Cathartic-conscious America . . . New books on health . . . Questions and answers . . . Tennis for any age . . . Andreas Vesalins (1514–1564) . . . "But it was only a little pimple!" (but it brought death to the navy).

In "School and Health":

Who should teach youth? . . . Our health-centered program (Somerset County, N. J.) . . . Safety on the highway (Arcata, Calif.) . . . Sources for materials on safety.

Health Education in the Journal—In *American Journal of Public Health,* July, 1937:

In "Developing a Housing Program in a Southern City," by Graves and Fletcher, pages 652 and 654:

By shading a map of the city on the lowest index blocks and then the blocks next best and so on, it has been possible to put on paper, for study, a picture of slum housing conditions so that the cores of bad areas stand out, and radiating from these cores are the slums in varying degrees of dilapidation and insanitation.

In "Practical Aspects of Public Mental Hygiene," by Liber, "easy courses in child upbringing for parents and future parents" are urged (page 687); where schools do not "teach the necessary sexual facts to adolescents, public health agencies should undertake this work and open classes for young people" (page 688); and (page 688):

Although alcoholism has its roots in social life, an intensive educational campaign against it should be inaugurated and waged unceasingly . . . Educational instructions and campaigns should not be of the "Don't Spit on the Floor" type or in the form of an order to be obeyed blindly. No one coöperates with such orders, because they are not convincing. Reasons must be given and the interest of the people, nay, even their enthusiasm must be aroused.

In "Infant Mortality in New York City," by Rice and others: under "Probable Causes for the Reduction" (page 703) part of credit goes to "the general health education of the public," and the splendid coöperation in matters pertaining to public health" given by relief agencies," and (page 705) "the education of all women to secure early, adequate, and continuous prenatal care is being stressed."

"Preliminary Report of the Sub-Committee on the Educational Qualifications of Public Health Statisticians" (page 707).

"Preliminary Report of the Sub-Committee on the Educational Qualifications of School Health Educators" (page 711).

"Preliminary Report of the Sub-Committee on the Educational Qualifications of Adult Health Educators" (page 717).

For those who write for the *Journal* and other periodicals: "Remember the Editors and the Printer" (page 728).

New members of Public Health Education Section are listed on page 753.

Health "Best Sellers" are noted on page xx.

And exhibits at the 66th Annual Meeting are mentioned on page xix.

AVAILABLE FOR USE

"Children's Bureau and Other Publications Relating to Children." List of government publications. Supt. of Documents, Washington, D. C. Revised. *Free.*

"How to Save a Life from Drowning." Artificial respiration, prone pressure method. 4 pages. Connecticut State Dept. of Health, Hartford, Conn.

"Ivy Poisoning: A Summer Health Problem" is a better than usual pamphlet of 6 pages with cover; ivy pictured on first cover page, poison sumac on the last cover page. State Dept. of Health, Albany, N. Y.

"Measles," a 4 page folder. The dangerous age; importance of care; symptoms; parents must prevent the disease; prevention of deaths. New York State Dept. of Health, Albany.

"The Publications of the N.O.P.-H.N." National Organization for Public Health Nursing, 50 W. 50th St., New York, N. Y. Revised, classified list of reprints, publicity loan folders, plays, etc.

"The Relief of Pain in Cancer Patients," by Dr. E. M. Daland. Professional. Supt. of Documents, Washington, D. C. *5 cents.*

Slides on public health nursing are offered by National Organization for Public Health Nursing, 50 W. 50th St., New York, N. Y. The 26 pictures have been chosen to represent a variety of public health nursing activities. Each slide carries a caption. An explanatory sheet accompanies the set. *$2.50 for a week,* plus transportation costs.

It should be quite possible to make a local application of them, and doubtless they will be popular for annual meetings and other meetings where it is desired to give a broad picture of public health nursing service.

"Somebody's Boy," a boy picture, and several verses. A safety poster, one of many from Employers Mutuals, Wausau, Wis. *Free.*

"A Summer Reading List" will be supplied by National Public Housing Conference, 112 E. 19th St., New York, N. Y. *Free.*

"Mats supplied" as noted from time to time in this section of "Public Health Education" means that a paper "mat" will be supplied so that a newspaper may reproduce display headings and text, making a cut which can be assembled with other cuts and type in making up forms for the printed page.

"Child Health and Common Sense" is a series of 250 words syndicated series of health articles by Dr. A. G.

Ireland, director of physical and health education, New Jersey State Dept. of Public Instruction. Copy and mats supplied by Health News Service, 22 E. 40th St., New York, N. Y. *Free.*

"Safe Way to Reduce? Yes, But Be Careful." A second series by "The Health Reporter." Mats supplied. Health News Service, 22 E. 40th St., New York, N. Y. *Free.*

Also from the same source "vital health questions" and "valuable health hints" in a series of cartoon questions and answers entitled, "What Do You Know about Health?"

"Speaking of Safety" is a series of 24 cartoons, 4 inches by 5½ inches, mats being supplied free to the editor in each city who first asks for them. "The illustrations deal with leading causes of highway accidents and attention is focused on them in a novel way." National Safety Council, 20 N. Wacker Drive, Chicago, Ill. *Free.*

From Children's Bureau, Washington, D. C. *(free)*:

"When Disaster Cuts Down Home-Grown Food." Large page folder, food guide for the family.

"Physical Status of 219 Pueblo Indian Children," by Dunham, and others, 11 pages.

"Child Management," by D. A. Thorn. M.D. Revised. Children's Bureau, Washington, D. C. Includes sex instruction.

DEEDS AND DEVICES

Allstate Insurance Company, Chicago, Ill., Sears Roebuck automobile insurance affiliate, issues a wall calendar with health and other usable information on the back of the date sheets.

Before a group of distinguished guests, President Roosevelt presented the 1937 award in the Gorgas essay contest, conducted by Gorgas Memorial Institute, 1835 Eye St., N. W., Washington, D. C.

"Chicago Poll Opens War on Social Disease . . . Questionnaire asks each citizen if he is ready to take free and secret blood test for syphilis . . . Referendum Seeks Clinical Needs Data . . . U. S. providing franked envelopes; Illinois and City Boards take part." Thus did Chicago's Mayor Edward J. Kelley's Committee for the Control of Syphilis and Gonorrhea get front page space in *New York Herald Tribune,* and other New York dailies.

"Child Health Section" of *Journal and Sentinel,* Winston-Salem N. C., appeared May 2, 1937. A 20 page tabloid, with articles by Dr. Vaughan of Detroit, Dr. Ferrell of New York City, Dr. Myers, University of Minnesota, and many others.

District health officers of New Mexico, in conference, adopted the following resolution:

WHEREAS the most fundamental and lasting benefits of the science of hygiene are secured to the people by their education in the ways of health and . . .

WHEREAS the spread of such knowledge in this state can be achieved much more effectively diagraphically than dialectically and

WHEREAS the newspapers of the state constitute the most potent medium for diagraphic presentation, be it

RESOLVED that this third conference of District Health Officers records its deep sense of obligation to the press of New Mexico for its interest in the public health and for its generous allocation of space to news stories and feature articles on public health.

Ernest Poole, the author, has written a long series of letters in the course of several years in which appeals have been made for Henry Street Nursing Service, 99 Park Ave., New York, N. Y. A summer vacation letter is accompanied by a blotter which carries a Skippy strip in three pictures.

A folder, "privately printed," to thousands of departmental workers, professional and non-professional, who by their combined efforts have advanced New York City's hospital standards, this pamphlet is dedicated by a grateful executive. The 9 pages of copy is all quoted material about the Dept. of Hospitals or the hospitals: national, state, or local groups or individuals

who have visited, studied, or written about the department or the hospitals.

The following advertisement was inserted in Toronto newspapers by Health League of Canada:

Summer Resorts: Attention! Summer hotel owners!

The Health League of Canada is compiling a list of Ontario summer hotels which serve only pasteurized milk. If your name should be on this list please advise us at once Health League of Canada, 105 Bond Street, Toronto.

A gonorrhea placard, and two syphilis posters in color have been issued by State Dept. of Health, Trenton, N. J.

"Help save 38,000 lives. Cut traffic accidents 35 per cent by 1940" is a message in red stamped on outgoing envelopes by a postage meter. For sample ask National Safety Council, 20 N. Wacker Drive, Chicago, Ill.

"Learn to do your part in prevention of disease" is printed near the top edge of envelopes of Baltimore Dept. of Health.

A placard from the Newark, N. J. Health Dept.:

Kissing the baby—unnecessary—unclean—dangerous—Protect me! We need your help—please do not kiss me! A kiss can be as dangerous as a bomb by spreading disease—Don't kiss the baby!

"Speed and Sudden Death—Drive Carefully" are stamped on mail by the postage meter of Jefferson County Board of Health, Birmingham, Ala.

Toronto has had a successful "Toxoid Week."

FOR EDUCATION OR REFERENCE

An analysis of the recently published study of medical care, and editorial discussion of the report, appear in *Journal of A.M.A.* April 10, 1937.

For examples of posters and information about other materials and devices offered to English health agencies see *Occasional Bulletin,* Health and Cleanliness Council, 5, Tavistock Square, London W. C. 1, England. *Free.*

"Medical Society Issues Warning against Pneumonia" and "My Idea Is This—On the Best Doctor." Newspaper reprints; letter size sheets. Public Relations Bureau, Medical Society of State of New York, 2 E. 103d St., New York, N. Y. *Free.*

The National Research Council has appointed a Committee on Scientific Aids to Learning, with James B. Conant, Harvard University Chairman, and Bethnel M. Webster, attorney and counselor at law, secretary. Dr. Irvin Stewart, engaged as director, has announced that the committee will be interested in motion pictures, broadcasting, photography, and mechanical recording of sound.

"New Health Frontiers." Report of 1937 Annual Conference of Milbank Memorial Fund, 49 Wall St., New York, N. Y. Housing, problems of adult life, nutrition, etc.

"The Newest Foster Mother," by J. A. Tobey. About quick-frozen human milk. Reprint. Address the author: 350 Madison Ave., New York, N. Y. *Free.*

"Public Health and the Traffic Accident Problem," another contribution of N. L. Burnette toward new approaches in studying and handling motor accidents. *Canadian Public Health Journal,* 105 Bond St., Toronto 2, Ontario. July, 1937, *35 cents.*

"Recent Progress in Health Education," Dr. W. P. Shepard. Reprint. Address the author, Metropolitan Life Insurance Co. San Francisco, Calif. *Free.*

"The Teaching of Cancer," by Dr. F. E. Adair, tells about the education of the lay public, of the doctor, of nurses and social workers, and of the medical student. "News on Cancer Education" introduces a new publication. "Fortune Article Published as

Book" describes the dollar book in which "Cancer, the Great Darkness" has been republished. "Revised Cancer Film Prepared for England" is a British form of the March of Time cancer episode. And two articles relate to the Women's Field Army. All of this in *Bulletin,* American Society for the Control of Cancer, 1250 6th Ave., New York, N. Y. July, 1937.

"What the Editors Say About Fireworks Accidents." Letter size folder, 4 pages, reproducing editorials. National Society for Prevention of Blindness, 50 W. 50th St., New York, N. Y. *Free.* Illustrates a usable idea.

"Work for a Sane Fourth," by Alfred E. Smith; "It Can Be Safe and Sane" by L. H. Carris. Reprints. National Society for Prevention of Blindness, 50 W. 50th St., New York, N. Y. *Free.*

MAGAZINE ARTICLES

We serve health education as well as the editor of our favorite general magazine when we write to the editor to suggest timely topics which have health implications.

But we need to get those suggestions to the editor well in advance of any possible publication date. The larger the circulation the more time elapses between the actual writing of an article and its publication.

All of the new picture magazines seem to be carrying more or less useful and entertaining material bearing upon phases of public or individual health, including the nature of the human body.

Some topics in June, 1937, issue of *Better Times,* Welfare Council, 44 E. 23d St., New York, N. Y. *(35 cents):* "Accomplishments in Health and Welfare Legislation," "Committing Mentally Defective Children," "Social Work as a Psychiatrist Sees It," "Housing Highlights in Legislation," "District Health Center Development in New York City," "Medical Social Service in New York Hospitals," "The Place of the Social Worker in Venereal Disease Control," "Care of Chronically Ill Children."

"Damien the Leper," by John Farrow. *Book Digest,* 350 E. 22d St., Chicago, Ill., July, 1937. *25 cents.* "A story of the adventures of that strange, dogmatic, fanatical Saint of God who dared the physical horrors of a leper colony at its worst."

"Life Squanderers." Editorial on American accident losses, pointed up by comparison of deaths in building the two great San Francisco bridges; a plea for community organization and education. Good for republication. *Collier's,* March 27, 1937.

"Don't Dent Your Fenders," by M. M. Stearns. *Collier's* June 12, 1937. "Almost everyone has a plan for stopping traffic accidents." "It was a motorcycle cop who got the idea of starting systematically at the bottom."

"Help in Sight," by J. D. Ratcliff. *Collier's* June 26, 1937. "Contact lenses that are fitted directly over the eyeball."

"We Can End This Sorrow," by Paul deKruif and Dr. Thomas Parran. *Ladies Home Journal,* Aug., 1937. Syphilis in Denmark. The companion authors insure closer adherence to actual facts than is always the case.

"Medical Care, Economics Debated: American Foundation Publishes Exhaustive Report on Study" (2 page review); "Slimming Fare: Barnard Girls Lose Weight through New Diet." *Literary Digest,* 354 4th Ave., New York, N. Y., April 10, 1937, *10 cents.*

"Gas Death Lurks on Unseen Wings: Carbon Monoxide Kills in Homes, Automobiles and Airplanes" ("four times as many gas deaths occur in homes as in private garages"); "Crackers and Milk: 'John D.' Beat Dyspepsia by Diet and Regular Habits for Longevity"; "Head-lights Glare on Auto Victims; Hit-and Run Drivers Haunted

by Dirges of Screeching Brakes." *Literary Digest,* June 5, 1937.

"Bold Pastor: Oklahoma Brings Syphilis Problem out into Open Church Discussion"; "Ministering Blue Angel of Mercy: Visiting Nurses Are Unsung Heroines of War on Disease"; "Allergy, Pollen and Ah-Choo Time: Hay-fever No Joke to Sufferers, Boon to Weedless Resorts." *Literary Digest,* June 12, 1937.

"Goblin Knocking at Doctor's Door: Socialized Medicine, Medical Phenix, Rises from Its Ashes." *Literary Digest,* June 19, 1937. Also: "Cheat Heat. There Are Ways of Drinking, Dieting, and Dressing to Keep Cool."

"Death's Holiday: Life and Limb in Jeopardy in Annual Orgy of Fire and Noise." Includes a "Foolish custom" quotation from 1729. *Literary Digest,* June 26, 1937.

"Summer Hazards: Best Cure for Poison-ivy and Snakes—Keep Away from Both." *Literary Digest,* June 26, 1937.

"Making Births Easier for Fathers." "Hospitals Are Providing Relaxing Salons for Fretting Sires." "Premarital Tests: States Awake to Disease Dangers, Hold up Marriage Licenses." *Literary Digest,* July 3, 1937.

"Where There's an Accident: Can You Help? Or Like Most People, Do You Simply Stand and Watch?" A picture page in *Look,* Des Moines, Iowa, Aug. 3, 1937. *10 cents.* A reminder that a group of pictures in sequence, with brief captions, are useful in stating problems, or in showing their solution.

"The Doctor's Dilemma." Editorial. *Nation,* 20 Vesey St., New York, N. Y. June 19, 1937. What really happened at Atlantic City at the A.M.A.

"Oklahoma Tries Coöperative Medicine," by J. Rorty. *Nation.* May 29, 1937. Oklahoma Medical Assn. vs. Farmers Educational and Coöperative Union.

"Recent Medical Progress," by Iago Galdston, *New Republic,* 40 E. 49th St., New York, N. Y., June 23, 1937. Heart surgery, the rest and starvation treatment of coronary thrombosis, protamine, insulin, fever therapy, insulin shock treatment of dementia praecox, prontosil.

"Research: Dr. Slye Lays Cancer Plans for Mice and Men" (with page of illustrations); "Fever: Therapists Convene, Affirm Wisdom of Hippocrates," *News-Week,* 1270 6th Ave., New York, N. Y. April 10, 1937. *10 cents.*

"Nationalized Doctors?" The American Foundation report, and the A.M.A. discussion. *Time,* 330 E. 22d St., Chicago, Ill. June 21, 1937. *15 cents.*

MOTION PICTURES

The Associated Press reports:

Animated cartoons on the ceiling, innovation in dentistry, are proving "very satisfactory" as a sedative for children's fear, said Dr. H. S. Dwyer of New York University.

"The Eternal Mask," by S. A. Oldham. Description of a Swiss motion picture, a study of modern psychiatry; endorsed by Dr. Joseph Jastrow. *Trained Nurse,* 468 4th Ave., New York, N. Y. April, 1937. *20 cents.*

If you are concerned about the mental or other social aspects of commercial motion pictures ask for a free sample of *Film Survey,* published by Associated Film Audiences, 250 W. 57th St., New York, N. Y.

Journal, A.M.A. (May 8, 1937) says:

In connection with recent emphasis on syphilis as a public health problem, the American Medical Association, by action of its Board of Trustees, and the U. S. Public Health Service, have jointly engaged in the production of a clinic on syphilis in a talking motion picture. After a preliminary announcement in the picture by Surgeon General Thomas Parran and President Charles

Gordon Heyd, the diagnosis of syphilis is covered by Dr. John H. Stokes of Philadelphia. Latent syphilis is discussed by Dr. Paul A. O'Leary of Rochester, Minn., the treatment of syphilis by Dr. Harold N. Cole of Cleveland, late syphilis by Dr. Joseph E. Moore of Baltimore, syphilis in pregnancy by Dr. James R. McCord of Atlanta, Ga., syphilis in the child by Dr. Philip C. Jeans of Iowa City, and the public health aspects of syphilis by Dr. Raymond A. Vonderlehr of the U. S. Public Health Service. The technic of taking blood for a Wassermann test, spinal fluid examination and intravenous injection are shown. The systematic technic of treatment is revealed not only on patients but also diagrammatically. It is hoped to provide with the picture a reprint of the main points brought out so that those who attend may carry away a permanent reference to the significant information. Copies will be made available to state and county medical societies, hospital conferences and other assemblages of physicians.

NEW

Literary Digest and *Review of Reviews* now combined and known as *The Digest*.

Ohio Public Health, Ohio Public Health Assn., 1575 Neil Ave., Columbus. An interesting feature is the 2 page list of staffs of state departments and state associations having to do with health.

Plain Facts, Bureau of Venereal Disease Control, New Jersey State Dept. of Health, Trenton.

This Job of Ours, Dept. of Health, 125 Worth St., New York, N. Y. An inside house organ, Dr. Rice talking quite conversationally to over 2,500 people who are the Department of Health.

What's New in Traffic Safety, National Safety Council, 20 N. Wacker Drive, Chicago, Ill. *Free.* A clip sheet.

A monthly review of scientific, educational, statistical, engineering, enforcements, and other developments in the field of automobile accident prevention. Published to provide background information for news and editorial writers, and other students of traffic safety. For use with or without credit.

REPORTING

Annual report of Board of Health, Maplewood, N. J., is an effective mimeographed report (with printed cover) for a small community.

The annual report of Milbank Memorial Fund (40 Wall St., New York, N. Y.) includes a chapter on education, training of personnel, school health education, adult education.

Annual report of Sacramento, Calif., Health Dept., carries a picture of the disease "war map," a city map on which are located cases of contagious disease. One page charts the distribution of Sacramento's official health dollar which includes 9 cents for cemeteries, and 6 cents for animal welfare and pound.

The customary health officer's long, uneventful looking *review of health conditions* (introducing the report of the department) could be given accent and distinction. One device is illustrated in the annual report of Hygienic Institute, Dept. of Health for La Salle, Peru, and Oglesby, with headquarters in Peru, Ill. As in the sentence above the key word or phrase in a paragraph is shown in black or bold face type, or in italics.

"A Study of the Adequacy of Public Health Services in Birmingham and Jefferson County." Letter size, 8 pages, processed. A vivid presentation of the *inadequacy* of the public health services which have been put on less than a minimum budget of 32 cents per capita. Issued by Fact Finding and Research Committee, Dr. Paul W. Shankweiler, chairman, Birmingham Southern College.

WANTED

We hope that the wants here expressed will be met by many readers.

If you can do so conveniently, please send copies of letters to the editor of this department of the *Journal.*

Wanted: A *motion picture* dealing

with milk pasteurization for showing in small urban centers. Address: J. G. Schaeffer, sanitary engineer, Provincial Dept. of Health, Regina, Saskatchewan.

Wanted: A *test or questionnaire* to be given to teachers concerning " their knowledge of health information which should be possessed by the modern high school graduate." Address: W. C. Crawford, superintendent of schools, San Diego, Calif.

Wanted: *County fair exhibit* ideas and information sources. Address: Dr. A. E. Hill, Tyler-Smith County Health Unit, Tyler, Tex.

Wanted: *Plays* for broadcasting about adult health problems. Address: Dr. Charles F. Bolduan, Dept. of Health, New York, N. Y.

Wanted: *Health plays* to be broadcast by a group of high school girls in Bristol, Va. Address: Dr. R. G. Beachley, Health District, Abingdon, Va.

Wanted: *Exhibit materials* on present status of immunization against typhoid, scarlatina, smallpox, diphtheria, and tetanus. Address quickly: Dr. M. Fernan-Nunez, Marquette University School of Medicine, Milwaukee, Wis.

Wanted: *Reference material* on " The Relation of Health Education to the School." Address: Ruth Jubb, R.N., Mosher Jordan Hall, Ann Arbor, Mich.

Wanted: *Lantern slides* for health education. Address: Alice H. Corson, Principal, Main St. School, West Springfield, Mass.

Wanted: *Health plays* for a group of high school girls to produce over a radio station. Address: R. G. Beachley, Deputy Director of Rural Health, Abingdon, Va.

JOURNALS AND BULLETINS

" Civilizing Rural Health," by I. M. Havey. Brief review of Red Cross rural nursing service. *Am. Journal of Nursing,* 50 W. 50th St., New York, N. Y. May, 1937. *35 cents.*

" Health Teaching in a Secondary School," by M. E. Bowen. " How can health education be incorporated in the curriculum? " *Public Health Nursing,* 50 W. 50th St., New York, N. Y. May, 1937. *35 cents.*

Public Health, Michigan Department of Health, Lansing, reports " Combating Early Syphilis," by John H. Stokes, with Foreword by Dr. Parran. Reprints are offered. This article appeared first in *Readers Digest,* Pleasantville, N. Y.

" Vacation Hazards," by W. J. Myers. *American Journal of Nursing,* 50 W. 50th St., New York, N. Y., June, 1937. *35 cents.* Precautions and warnings for health workers—and other people.

BOOKS AND REPORTS

The Control of Bovine Tuberculosis in Man—*By Nathan Raw, M.D. London: Bailliere Tindall and Cox,* 1937. 128 pp. Price, $2.00.

The value of this book is that it directs attention to the danger of bovine tuberculosis to human beings chiefly through the drinking of milk from tuberculous cows and in its advocacy of pasteurization for all milk used for children, except when "certified" according to the American plan. The author has for a number of years advocated vaccination against tuberculosis. His method has never been accepted. He is using a culture which he has carried on for 30 years and is now in its 340th generation.

One would think from the author's reference to his paper published in 1903 that he was the first to recognize human and bovine tubercle bacilli as varieties of the organisms producing tuberculosis. He was present at the London Congress on Tuberculosis in 1901, and also at the Congress in America in 1908. He was at that time fully aware of the work done in America, though there is no mention of it in his book. Everyone who knows anything of the history of tuberculosis is aware that the first proof of the danger of tuberculous cattle to human beings was given in the Laboratory of the State Live Stock Sanitary Board of Pennsylvania in 1901 and 1902, and there seems to be no excuse for not recognizing this.

While the book before us contains much that is useful, as history it is incomplete and it has too many careless and inaccurate statements to be a reliable guide. MAZŸCK P. RAVENEL

Personality—Its Study and Hygiene—*By Winifred V. Richmond, Ph.D. New York: Farrar & Rinehart,* 1937. 279 pp. Price, $2.50.

If the proper study of mankind is man, the proper study of man is the human personality. So it would seem from the extensive researches that have been conducted during the past 20 years in medicine, biology, psychology, psychiatry, mental and physical hygiene, social work, education and other disciplines, all of which have been increasingly oriented toward personality as the central concept in the study of human nature in its various phases.

In this, her latest book, Dr. Winifred Richmond, a psychologist who has served at St. Elizabeths Hospital, Washington, for many years, undertakes to "outline the modern approaches to the study of personality that have so far proved most fruitful in aiding our understanding of human behavior." The book does very well. It is an orderly, well organized, clearly written and informative presentation of the main developments in this field, an epitome, as it were, of our present knowledge of the subject.

Beginning with a chapter on the historical backgrounds of personality study, it describes the various methods of study—physical, psychological, and sociological—employed in recent years, and analyzes the "fundamental psychophysical make-up" of personality in terms of intelligence, emotion, energy, habit formation, and mental mechanisms—the so-called "dynamics of personality" as hypothesized by the leading schools of psychological thought.

The remainder of the book is given over to a discussion of the maladjustments of personality—the major psychoses, the neuroses and the minor abnormalities, the study and treatment of which have thrown so much light on the functioning of the normal personality.

The point of view adopted in the treatment of the material is reflected in the author's definition of personality as "an integration—the welding together into a functioning unit of natural forces—probably in the last analysis electrical and chemical — expressing themselves now in physical and now in mental terms." The human being, she says, is not a machine but "he is like a machine in that he is an organism composed of various parts which must work together if the organism is to perform the work of which it is potentially capable." Again, in differentiating personality from character, she defines the former as a "structure" built up in the individual from birth, and ascribes to the latter moral connotations which "cannot apply to personality." While this does not tell us "exactly what human personality is," and while it suggests implications that are debatable from the philosophical angle, it does comport with the dominant orientation in the scientific study of personality today, and conveys an adequate and objective picture, more descriptive than evaluative and critical, of the status of modern investigation of this central problem, and as such should prove exceedingly valuable to all students of the subject.

PAUL O. KOMORA

Health Education Year Book: 1937–1938. *Central Council for Health Education, 1, Thornhaugh St., Russell Square, W.C. 1, London, England.* 5/6 d.

We have nothing like it in this country, this *Year Book* picturing the health education organizations, the health education activities, and the educational materials of the United Kingdom. The inclusiveness of the information may be seen by this selection from the list of "health associations": Anti-Noise League, Boy Scouts Association, British Medical Association, Central Association of Mental Welfare, Dental Board of the United Kingdom, Eugenics Society, Garden Cities and Town Planning Association, Health and Cleanliness Council, Industrial Health Education Society, Jewish Health Organization of Great Britain, League of Nations Health Organization, National Adult School Union, People's League of Health, Royal Institute of Public Health, Sanitary Inspectors' Association, Town Planning Institute, Welsh Association of Physical Education, and Youth Hostels Association, a total of 75 organizations being listed and described.

In one section the main facts about the health associations are summarized. Then there are lists of journals, books, pamphlets, plays, and other printed matter. Another section describes the health education use of the Empire Marketing Board poster frames, and lists the posters, with detailed information, issued by the health associations.

Other sections tell about exhibits available, about the lecture services of the associations, and the offerings of motion pictures, projectors, and lantern slides. Every section includes introductory information and practical suggestions.

The information is inclusive, not selective, without any attempt at evaluation. Nor is there any suggestion of a program for the use of the widely diverse materials mentioned in the lists. Any way, all of that is another job, and probably a perennial one there, as it is here.

We do not have accessible such information as to health education sources

in the United States and Canada. We doubt that as many and as varied materials and services are available west of the Atlantic. And surely we have no body comparable to the Central Council for Health Education. This reviewer hopes that many readers will be able to examine the *Year Book.*

EVART G. ROUTZAHN

Fundamentals Relating to the Design and Operation of Exhaust Systems—(Pre. Ed.) *New York: American Standards Association, 29 W. 39th St.,* 1936. 28 pp. Price, $.40.

These specifications are part of a general project known as the Safety Code for Exhaust Systems developed under the administrative leadership of the International Association of Industrial Accident Boards and Commissions. The chairman of the Sub-Committee is Theodore Hatch of the Industrial Hygiene Division, New York State Department of Labor.

With a code number for each item, the report includes definitions, plant layout, and building construction, exhaust hoods (dispersion of atmospheric impurities, control of air motion, hood design), exhaust piping, the air-cleaning plant, the exhaust fan, construction and maintenance, and an Appendix of 19 references. Tables, diagrams, and formulae are included. This appears to be a very laudable attempt to standardize the features discussed, and has been prepared by a committee of experts. EMERY R. HAYHURST

The Little Things in Life: The Vitamins, Hormones, and Other Minute Essentials for Health—*By Barnett Sure, Ph.D. New York: Appleton-Century,* 1937. 340 pp. Price, $2.50.

The sanitarian who is looking for a comprehensive and generally authoritative review of the newest knowledge of nutrition will find it in this well printed book. The text was prepared for the layman by a professor of agricultural chemistry who has made some notable contributions to the science of nutrition, but the general reader may find that the material in it is not quite as "non-technical" as the author intended.

Most of the chapters are devoted to interesting accounts of the history, nature, availability, functions, and uses of the important food substances now known as vitamins, but there are also good chapters on allergy, ferments and digestion, and the ductless glands. Occasionally, the author has a tendency to exaggerate the influence of diet on human affairs, as in his inferences that cancer may be due to faulty nutrition, but on the whole the book is a reliable, readable, and valuable text on a significant subject with which every public health worker should be thoroughly familiar. JAMES A. TOBEY

Childless: A Study of Sterility, Its Causes and Treatment—*By Sam Gordon Berkow. New York: Lee Furman,* 1937. 307 pp. Price, $3.00.

The author of this very interesting and instructive book has performed a real service in bringing together a wealth of material upon a little understood and much maligned subject. Dr. Berkow has marshalled the available scientific facts of anatomy, physiology, and biochemistry and indicated where the maladjustments in the procreative process are liable to occur. He has pointed out possibilities of prevention and given approved methods of treatment.

After reading this volume one is convinced that childlessness is not merely a question of "unwillingness to bear children" but that it is a complex problem in many cases with deep sociological, psychological, and physiological roots. The most exhaustive and painstaking investigation is neces-

sary frequently to determine just where the difficulty lies. There is no room for legerdemain in the handling of difficult and obscure cases. Every facility at the command of the modern obstetrician and gynecologist must be brought to bear upon the solution of the problem of childlessness. Here is a book that states the problem clearly, although it does not solve it completely. With the declining birth rate and a yearning in many homes for babies instead of lap-dogs this book should meet with ready reception on the part of medical profession and laity alike.

RICHARD A. BOLT

Guiding Your Life: With Psychology as a Key—*By Josephine A. Jackson, M.D. New York: Appleton-Century,* 1937. 352 pp. Price, $2.50.

Here is popular psychology for each and all of the seven ages of man, presented by the author of the highly successful book of a few years ago, *Outwitting Our Nerves.* It is not profound, but it is practical, homely guidance, offered in a readable style to all those who need mental hygiene. And who does not? JAMES A. TOBEY

Grundlagen Methoden und Ziele der Hygiene. Eine Einführung für Mediziner und Naturwissenschaftler, Volkswirtschaftler und Techniker—*Von Prof. Dr. Werner Kollath. Leipzig: Hirzel,* 1937. 508 pp., 39 figs. Price, R.M. 20.

This is a comprehensive, very up-to-date, elementary treatise on the subject of hygiene in all of its varied aspects. It is especially helpful in indicating the basic relations of hygiene to the border lines between physics and biology in the fields of atomic physics and radiant energy; to the border lines between chemistry and biology in the field of the content, direction, and causes of energetics; and to the border lines between medicine and biology with reference to the intimate organization of the living substances and the periodicity of vital phenomena. Among the subjects treated are nutrition, growth, climate, clothing, personal hygiene; sanitation of dwellings and cities, heating, ventilation, cleaning, illumination, sanitation of the soil; water supplies, sewage disposal; sources, qualities, distribution, conservation, and preparation of vegetable and animal foods, alcoholic and narcotic drinks; dangers of restricted nutrition; vital statistics, health insurance, and race culture; communicable diseases and immunity. CHARLES A. KOFOID

Parent-Teacher Publicity — *By Clarice Wade. Washington: National Congress of Parents and Teachers,* 1936. 83 pp. Price, paper $.25; cloth $.50.

This is a text of instructions to Parent-Teacher Associations as to how they may get publicity. It discusses publicity channels, such as periodicals, radio, posters, news bulletins, and exhibits; the press and publicity: suggestions on news writing; publicity relationships; and aids to efficiency.

It has in it many valuable suggestions to groups desiring publicity. Local and other health committees will find in it much worth while material.

CHARLES H. KEENE

Health Protection of Welders—*By The Industrial Health Section of the Metropolitan Life Insurance Company, New York.* 27 pp., ill. Free.

Welding, burning, and "cutting" of metals and minerals by the gas or electric torch, also "metallization" have become so enormously important in modern industry and offer so many hazards to life and health that this unusually complete bulletin is quite opportune.

Temperatures from gas flames to 6,000° F., electric arcs to 10,000° F., and the "electric atomic hydrogran arc"

so high as to melt all metals and even quartz, produce not only dangerous radiations but act upon the atmosphere itself to which may accrue the products of the gases used, the metals and minerals worked upon, of coatings of electrodes, flux rods, etc. Even chest pictures closely resembling silicosis may occur in welders. There is also the occasional exhaustion of oxygen in the air in unventilated spaces. The effects, preventive measures, and in some instances, treatment of the afflictions produced are briefly considered.

EMERY R. HAYHURST

Wholesome Living Series—Health and Happiness—*5 vols. (ill.). By Jesse Feiring Williams, M.D., and Theresa Dansdill, A.M. New York: Benjamin H. Sanborn and Co.,* 1935–6. *Health and Happiness,* 106 pp., $.64; *Health and the Rules,* $.64; *Health and Control,* $.68; *Health and Service,* $.72; *Health and Ideals,* $.80.

This is a helpful series for the classroom or health teacher to add to her reference library. The field of health is comprehensively covered, yet much of the material in the four volumes has been taken from books, magazines, and posters heretofore published, and so the investigator of health teaching material too often meets excerpts of material she knows in its original form.

ANNA B. TOWSE

Man in a Chemical World—*By A. Cressy Morrison. New York: Scribner,* 1937. 292 pp. Price, $3.00.

"This book is intended to be educational, from the cultural as well as the utilitarian points of view. Its object is to impress the man in the street with the fact that the chemical industries of the United States render a service that touches practically every activity in which he engages. In fact, it is the main purpose of the book to awaken him to the realization that he is utterly dependent upon these industries not only for the necessities and luxuries of life, but also for his very existence." No better statement concerning the object of this book can be made than is found in the foreword.

The volume is the outgrowth of the celebration of the 300th anniversary of the birth of chemical industry in the United States. It is vouched for by the highest authorities in the chemical world and credit is given to "hundreds of leading industrialists" for reviewing the material presented.

It is a remarkable story and one which professional men as well as laymen can read with advantage. It touches public health only at certain points, as in Chapter 3, "Keeping Well," so that an extended review is not called for in our *Journal.* Indeed to produce such a review would be difficult, since the book itself has necessarily been condensed. Prepared for lay readers, is does not go into detail but in a most readable and interesting fashion presents to us the wonders of modern chemistry and shows to what an enormous extent we are indebted to this wonderful science. It properly begins with the chapter "Nature Points the Way," showing that nature is the greatest chemist of all, and the succeeding chapters each take up some well known field in which chemistry is predominant.

The book is well printed, exceptionally free from errors, and illustrated with black and white cuts. It can be highly commended for general education. MAZŸCK P. RAVENEL

Trauma and Disease—*Edited by Leopold Brahdy, M.D. and Samuel Kahn, M.D. Philadelphia: Lea and Febiger,* 1937. 613 pp. Price, $7.50.

With an imposing list of 22 additional authors, Drs. Brahdy and Kahn

present a symposium on the relations between trauma and diseases, each writer contributing according to his knowledge in his individual field. The book purports "to present the accumulated knowledge concerning the relationship of a single trauma to disease, to indicate the limitations of this knowledge, and to develop the underlying principles on which, in any given case, the medical opinion should be based."

The first chapter contains a discussion of trauma in the etiology of disease, the editors having divided diseases into three groups, according to trauma relationship, as follows: (1) "Those which are practically always the direct result of trauma—fractures, lacerations, etc. (2) Those which are never the result of a single trauma—such as measles. (3) Those which usually develop without trauma, but in which trauma *may* be a causative factor—angina pectoris, kidney abscess, exophthalmic goiter, etc."

The second chapter, Trauma and Heart Disease, by Drs. Paul D. White and R. Earle Glendy, carrying out the specific intent of the book is followed by successive chapters on the relationship of trauma to other conditions and diseases. All are well written, with clarity, and with a careful exposition of the respective subjects.

Although the volume does not attempt to approach the subject of Trauma and Disease from the standpoint of the medico-legal expert it would have been extremely valuable and useful to include more references to court decisions than are cited, with notations to guide the practitioner in his "everyday" consideration in matters of this sort. The authors are qualified to discuss the determinate and indeterminate factors in causal relationship, and although not stressing the medico-legal phases, they might have shown in greater detail the application of their knowledge to important cases with respect to the interpretation of the courts.

Each chapter reflects the ingenuity of the author in presenting his material and to the editors must go the credit for its arrangement, especially the bibliographies which are cited in extenso following the major sub-divisions within the respective chapters.

The reader is aware of general and adequate coverage of the subject of Trauma and Disease. The data presented should stimulate further study and closer attention to the details in establishing causal relationship.

A place has been reserved in the physician's library for this type of book for many years. Not only in content but in make-up is this particular book deserving of this reservation.

BERNARD S. COLEMAN

Public Health and Social Problems in the United States of America—*League of Nations Quarterly Bulletin of the Health Organization.* Vol. V, No. 4 (Dec.), 1936. 152 pp. Single number 65 cents.*

This thoughtful and constructive report on American health and social problems reflects statesmanship of the highest order. A group of distinguished public health officers and professors of hygiene from Europe participated in 1935 in a collective study tour in the United States arranged by the Health Organization of the League of Nations and the U. S. Public Health Service. The group was accompanied by Dr. F. G. Boudreau, member of the Health Section, and by Dr. J. O. Dean of the Public Health Service.

The introduction sketches the general background of natural, economic, and social conditions which determine the

* This bulletin also contains: Health Indices, a study of objective indices of health in relation to environment and sanitation by K. Stouman and I. S. Falk, and a report by Dr. A. Stampar on his missions to China.

character and extent of the health problems under the headings: the physical heritage and the advance of the machine age, the biological inheritance, and the social heritage. Attention is directed to the gain in expectation of life, to mortality rates, to the extent of illness and of physical and mental defects and non-disabling diseases, and to the problem of providing satisfactory medical care.

An account of public health work, as seen in federal health agencies, state, municipal and rural health organizations, gives some of the outstanding impressions of the significance of the work as well as a description of administrative features. The value of efforts to secure coördination of health services is stressed. Attention paid to cancer and venereal diseases is considered as an indication that the program of modern health departments in America is being reformed in accordance with changes in the health problems; now that so much progress has been made in the protection of child life, more attention is being paid to adult hygiene. Again—

> Public health education is a major activity in this department as regards communicable diseases, child and adult hygiene, and tuberculosis. Pamphlets, lectures, exhibits, films, the radio, and all other means are fully and intelligently used. Public health nursing is a main reliance in this field.

The group was also struck by the tendency for decentralization in the health departments of large cities, and by the powerful means through the health center of bringing about coöperation between the multitude of health and social agencies. Another coördinating agency described is the health council or health federation.

> Such bodies . . . should give to their members a broader view of the community's health and social problems, as well as more detailed knowledge of the facilities which exist to deal with them; and their value as agencies for health education must be very high.

Measures taken to initiate and carry out a national housing policy, a matter of only recent concern, are briefly described.

> *Finally, there is the complex question of* city planning to meet modern conditions—a problem which is far from being solved. We have referred to the decentralization of industry and the planned use of land—two factors which concern city planning in its wider aspects. In fact, housing policy is so clearly related to all aspects of modern civilisation that progress in its elaboration cannot be more rapid than the adaptation of technology to social progress. The lack of such adaptation has brought about many social maladjustments in the form of serious social and health problems which it is the duty of society to deal with in an enlightened way; and not the least of these maladjustments is the housing problem.

Among other subjects discussed are the Tennessee Valley Authority, the Promotion of Social Security, and the Teaching of Preventive Medicine. This review falls far short of doing justice to this enlightening appraisal. After reviewing the facts, the authors discuss the spirit which animates the efforts, the evolution which is taking place and the lessons to be learned.

> . . . Effort in favour of public health cannot be really fruitful unless it is accompanied by parallel and general improvement in social welfare. It follows that progress in the solution of health problems must necessarily proceed at the same pace as progress in the economic, agricultural, and industrial fields.
>
> . . . Many more pertinent facts might be mentioned to demonstrate the existence in the United States of this transforming process of evolution guided by a coördinated programme of planned economy. In order that *this evolution may develop* and result in the improvement in the general welfare which is so ardently desired, it is indispensable that all agencies and elements whose participation is necessary must be well fitted for the tasks entrusted to them. The conception of public health work must not be restricted to its former limits. *It must broaden out beyond* the scope of preventive medicine to advance further and further into the field of social protection in the largest sense of the words. In this connection, a new orientation may be seen in the training given by certain schools of medicine and hygiene, which place special

emphasis in their programmes of study, not only on the teaching of preventive medicine, but also on so-called social medicine and sociology. By efforts to place the future physician in contact, not only with the patient, but also with the environment in which the patient lives, he is made to take into consideration the methods and means which must be adopted to assure the defence, assistance, and security of the patient and his family against the vicissitudes which may endanger his life and his work.

It is along the path which has been cleared by these schools that more rapid and general progress must be made if that enlightened support is to be obtained which is so vital for the solution of modern problems and for the success of the work undertaken to bring about sanitary, social, and economic reconstruction.

IRA V. HISCOCK

Social Welfare: A List of Subject Headings in Social Work and Public Welfare—*Special Libraries Association, 345 Hudson Street, New York, N. Y.* 64 pp. planographed. Price, $1.00.

Those who need to keep abreast of trends in social work will find a helpful aid in this new publication of the Special Libraries Association. A Committee of the Social Sciences Group chose the terms from lists actually in use by libraries and social agencies. Specialists in both fields were consulted. The list is intended mainly for those who handle collections of books and pamphlets in social work, but it serves also as a conservative but forward looking guide to the use of terms, including a number of the field of public health.

I. L. TOWNER

Report of The Hospital Survey for New York—*Presented to the Survey Committee by its Study Committee. New York: United Hospital Fund,* 1937. Vol. II, 1246 pp. Price, $2.75.

Diminished financial support of essential community services is a prevalent result of severe economic disturbances. The individuals and groups who normally provide funds find themselves during depression periods unable to do so in an equal measure, with a consequent stimulation of surveys and appraisals, in order to determine what is most essential and what must under all circumstances receive continued support.

The Hospital Survey for New York is intended to be "A description of the Institutions and Agencies concerned with the Organized Care of the Sick in the New York Metropolitan Area, with Analysis of Their Use and Cost, and Consideration of Plans for the Future."

This report was sponsored by a general committee of 100 outstanding citizens of Metropolitan New York. A Study Committee of 8, Dr. George Vincent, Chairman, included prominent leaders in American medicine and hospital administration. The activities of the Survey Staff, Dr. Haven Emerson, Director, were supplemented by qualified collaborating individual authors who wrote important chapters on subjects most familiar to them.

The objective was not only the analysis of the use of over 850 institutions and agencies in Metropolitan New York by an estimated population of over 10 million people and the cost, but also to lay down principles and objectives which will best render hospital service to an estimated population of 18 million, as prophesied by the year 1960. This is, indeed, commendable long-range planning, and the reviewer is in complete accord with the laudable statement in the preface that "Just as our complex transportation services will be ultimately succeeded by a unified system suited to the requirements of a predictable future size of the population, so the organized care of the sick a generation hence will be best provided for by an orderly growth and coördination of present voluntary and municipal facilities to meet the

expanding knowledge and skills of the medical sciences."

Existing institutions for the care of the sick and dispensaries in the various boroughs of New York are listed and classified by type of control. Chapters are devoted to the characteristics of the population, hospitals and their services, out-patient service, nursing care, medical social service, convalescent care, the care of the chronic sick, etc. A very important chapter is devoted to necessary essentials for good care of the hospital patient.

Among the many valuable conclusions and recommendations are the following:

1. The creation of a Permanent Planning Group to deal with the question of major expenditures, particularly in relation to hospital expansion.
2. Continuance of dual system of care of sick poor both in Governmental and voluntary hospitals, the latter to be reimbursed from tax funds.
3. Organized medical domiciliary care, as an extension of hospital out-patient service.
4. A revision of policies to provide for admission to general hospitals of those suffering from mental disease, tuberculosis, gonorrhea, and syphilis.
5. The discontinuance of the erection in New York City of general hospitals of less than 200 beds.
6. Adjustment of nursing hours to meet the difficult needs of the acutely ill.
7. Organization of out-patient departments and dispensaries as a part of general hospitals.
8. Improvement in facilities for care of the chronic sick, the convalescent, and organized care of sick in homes, including nursing care.
9. Extension of provisions for adequate medical social service.
10. Further provision of facilities for the treatment of cancer, heart disease, and diabetes, and for dental care.

This report is a well written, thorough analysis and appraisal of existing community resources in the field covered by the survey. Faults of the past are pointed out, and logical conclusions and sound recommendations presented by those qualified to analyze and recommend. Certainly a community in which there is expended approximately 50 million dollars a year for hospital care should benefit from the emphasis placed on better planning, better interrelation, and extension of needed facilities. CHARLES F. WILINSKY

School Health Problems — *By Laurence B. Chenoweth and Theodore K. Selkirk. New York: Crofts,* 1937. 387 pp. Price, $3.00.

This is designed "to acquaint students of education, teachers in service, and others interested, with the broad general nature of health problems in schools." Not for a number of years has an intensive effort been made to cover the health activities of the school program. After discussing at length numerous factors bearing upon growth, including a chapter on malnutrition, it takes up various phases of the physical examinations of school children, the control of communicable disease, lighting, acoustics, special classes for handicapped children, and tuberculosis at the school age. It discusses mental hygiene as related to school problems, and considers briefly the relation of physical education to the health of school children, and the accident problem.

The last chapter gives an excellent discussion and outline of school health administration. This is a special contribution by Richard A. Bolt, M.D. It includes a discussion in outline of the arguments for different sources of control of school health work, of its scope, and of the legal background of the public health law.

It is a worth while addition to the school and public health literature.

CHARLES H. KEENE

The Mind of Man: The Story of Man's Conquest of Mental Illness —*By Walter Bromberg. New York: Harper,* 1937. 323 pp. Price, $3.50.

While this book is advertised as

being "a work of scientific authority for the layman," it will prove of undoubted interest to physicians. The author gives a fascinating picture of the rise and fall of the various modes of treatment of mental illness from those in vogue 7,000 years ago up to the present. One cannot but note that the space given to the psychoanalytic schools greatly overshadows that devoted to the psychobiological and mental hygiene points of view, which deserve greater emphasis. There is a fairly comprehensive bibliography, arranged chronologically, in several sections, to correspond with the historical approach.

The book reads easily. The story of the progress of mental healing from the days of belief in magic, through the domination of religion and faith-healing up to its emergence as psychiatry and psychotherapy, is traced in consistent and very attractive style. The dynamic presentation, showing the correlation of varying viewpoints, is especially satisfying.

The historical account is the most valuable contribution of the book. The critical interpretation of some of the present-day therapy is debatable. That insulin brings about prompt remission in a large proportion of cases of dementia praecox is still unproved. Only further experimentation can answer this and similar questions.

The book is highly recommended for its historical content. It should be read by all physicians, some of whom may be surprised to find that their conception of insanity belongs to the Middle Ages. RUTH E. FAIRBANK

BOOKS RECEIVED

CLINICAL PARASITOLOGY. By Charles Franklin Craig, M.D., and Ernest Carroll Faust, Ph.D. Philadelphia: Lea & Febiger, 1937. 733 pp. Price, $6.50.

CLINICAL PSYCHOLOGY. A Handbook of Children's Behavior Problems. By C. M. Louttit. Edited by Gardner Murphy. New York: Harper, 1936. 695 pp. Price, $3.50.

PRINCIPLES AND PRACTICE OF PUBLIC HEALTH DENTISTRY. By J. A. Salzmann, D.D.S. Foreword by Alfred Walker, D.D.S. Boston: Stratford Co., 1937. 584 pp. Price, $4.00.

FEEDING BEHAVIOR OF INFANTS. A Pediatric Approach to Mental Hygiene of Early Life. By Arnold Gesell, Ph.D., M.D., and Frances Ilg, M.D. Philadelphia: Lippincott, 1937. 201 pp. Price, $4.50.

THE COST OF ADEQUATE MEDICAL CARE. Medical Economics Series. By Samuel Bradbury, M.D. Edited by Michael M. Davis. Chicago: University of Chicago Press, 1937. 86 pp. Price, $1.00.

HEALTH UNDER THE "EL." The Story of the Bellevue Yorkville Health Demonstration in Mid-Town New York. By C.-E. A. Winslow and Savel Zimand. New York: Harper, 1937. 203 pp. Price, $2.25.

TUBERCULOSIS. A Book of Practical Knowledge to Guide the General Practitioner of Medicine. By Lawrence F. Flick, M.D., LL.D. Philadelphia: Published by the author, 1937. 330 pp. Price, $3.00.

PRINCIPLES AND PRACTICE OF CLINICAL PSYCHIATRY. By Morris Braude, M.D. Philadelphia: Blakiston, 1937. 382 pp. Price, $3.50.

ANATOMY AND PHYSIOLOGY OF PHYSICAL TRAINING. By Major R. W. Galloway, D.S.O. Introduction by E. P. Cathcart, LL.D., M.D. Baltimore: Wood, 1937. 182 pp. Price, $2.50.

PRACTICAL METHODS IN THE DIAGNOSIS AND TREATMENT OF VENEREAL DISEASES. By David Lees. Edited and revised by Robert Lees, M.B. (3rd ed.) Baltimore: Wood, 1937. 608 pp. Price, $5.00.

THE PSYCHOLOGY OF THE UNADJUSTED SCHOOL CHILD. By John B. Morgan, Ph.D. (rev. ed.) New York: Macmillan, 1937. 339 pp. Price, $2.25.

SHADOW ON THE LAND: SYPHILIS. By Thomas Parran, M.D. New York: Reynal & Hitchcock, 1937. 330 pp., ill. Price, $2.50.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Typhoid Flavored Cream Puffs—Another instance of bakery cream puffs being contaminated by a typhoid carrier and causing an outbreak. What is being done about this hazard in San Francisco is appended to the news item.

ANON. Typhoid Outbreak Traced to a Sporadic Carrier without Clinical History of the Disease. Pub. Health Rep. 52, 28:929 (July 9), 1937.

Observations on Many Matters—For the health worker with his nose close to the grindstone of a routine administrative job, this brief discussion of the larger objectives of public health should be required reading. Being a series of summaries, the report omits much, but what is included proves most stimulating.

BOUDREAU, F. G., *et al.* New Health Frontiers. Proceedings of the Fifteenth Annual Conference of the Milbank Memorial Fund, 1937.

Dangers of Trichinosis—Garbage-fed hogs have trichinae 3 to 5 times as frequently as others. Garbage feeding, as ordinarily carried on, is objectionable, and must somehow be regulated.

HALL, M. C. The Rôle of the Garbage-fed Hog in Production of Human Trichinosis. Pub. Health Rep. 52, 27:873 (July 2), 1937.

For Men—How to shave has been put to a scientific study. It becomes quite a chore when properly performed, but the authors say it's worth the trouble.

HOLLANDER, L., and CASSELMAN, E. J. Factors Involved in Satisfactory Shaving. J.A.M.A. 109, 2:95 (July 10), 1937.

Making Vaccines—How typhoid vaccine is made in the Army Medical School laboratory is told in detail and with some excellent photographs. The latter should stimulate sanitarians to want to do as well pictorially by some of their own laboratory or field services.

HOLT, R. L., and HITCHINS, A. P. Typhoid Vaccine: The Technique of Its Preparation at the Army Medical School. Pub. Health Rep. 52, 26:829 (June 25), 1937.

Coloring for Foods—Written for the educated laity, this paper on the use and abuse of coloring matter in food will prove interesting to those sanitarians who know little about the food and drug branch of public hygiene.

LYTHGOE, H. C. The Coloring of Food: Its Use and Abuse. Sci. Month. p. 119 (Aug.), 1937.

About Tuberculosis Control—A fine thumb-nail sketch of the growth of the tuberculosis program and what it is all about. Two thousand years of clinic, 200 of laboratory, and 50 of cultivating the field: truly a stimulating conception.

LONG, E. R. The Clinic, The Laboratory, and The Field. Am. Rev. Tuberc. 36, 1:1 (July), 1937.

When Birth and Death Rates Meet—This should be required reading for all alarm-viewers and whither-are-we-drifting pointers. In it the suggestion is made that a stationary population, which probably will be reached in the latter half of this century, may be a good thing. The reasons for the assumption are discussed.

LORIMER, F. The Significance of Imminent Population Changes in the United States. Milbank Quart. 15, 3:207 (July), 1937.

More About Syphilis Control—Beginning with a pat, 60 year old quotation from Sims, what we know about syphilis is briefly stated, and a plan for its control is outlined. Trained public officers, control laws, premarital medical certification, diagnostic and treatment facilities, educational programs, are all important considerations. Osler is quoted to excellent effect at the close.

PARRAN, T. Control of Syphilis. J.A.M.A. 109, 3:205 (July 17), 1937.

In England Health Officers Are Concerned with Housing—Among the many efforts to better the health of the people, first place should be given to the campaign to improve the housing of the working classes; so begins an interesting British discussion which causes one to wonder why American sanitarians seem so free from all responsibility in matter of decent housing.

PEIRSON, T. The Contribution of Recent Housing Legislation to Public Health. J. State Med. 45, 7:397 (July), 1937.

Scope of Nursing Visits—Unselected samples of nursing records of 128 families with children revealed that half had children in more than one age group. More use might be made of the home visit to extend service to other children needing health supervision. Although numbers of visits per family varied, the analysis of health needs showed no significant differences.

RANDALL, M. G. Family Composition Used in the Analysis of Home Visits by Public Health Nurses. Milbank Quart. 15, 3:275 (July), 1937.

British Obstetrical Services—This discussion of the importance of the midwife in the British program for improving maternal health will provide stimulating reading for those American child hygienists who still adopt the ostrich's method of ignoring the existence of midwives here.

SAVAGE, W. G., and NASH, E. H. T. The Future of Obstetric Practice. Pub. Health. 50, 10:317 (July), 1937.

For Safer Motherhood—The main beneficiary of good prenatal care is the offspring, says the author of this provocative discussion of how adequate antepartum care may be provided for the expectant mothers of the community. Nursing care cannot be a substitute for medical attention, is the conclusion of the paper.

TAMIS, A. B., and CLAHR, J. Antepartum Care. J.A.M.A. 109, 3:195 (July 17), 1937.

Previable Termination of Pregnancy—In a sample group of New York women, it was found that of every 100 pregnancies, 83 resulted in live births, 2.7 in stillbirths, and 14.5 in abortions. This is a lower abortion percentage than was reported among women attending birth control clinics.

WIEHL, D. G., and BERRY, K. Pregnancy Wastage in New York City. Milbank Quart. 15, 3:229 (July), 1937.

ASSOCIATION NEWS

NEWS AND NOTES CONCERNING THE 66th ANNUAL MEETING NEW YORK CITY

OCTOBER 5–8

TO make some attempt at chronological order, we devote some space first to those things to which attention should be given now, in advance of the convention. Other items cover information as to what awaits you in New York.

YOUR HOTEL

YOU will be comfortable at any of the hotels to be used as the scene of the meeting—the Pennsylvania, the New Yorker, or the McAlpin. Elsewhere in this *Journal* is published a reservation blank. If you have not already done so, make your reservation now.

YOUR CONTRIBUTION TO THE MOTION PICTURE PROGRAM

MOVIES, both popular and professional, will be shown at hourly intervals during all 4 days of the convention. A miniature movie theatre will be located on the Mezzanine floor of the Hotel Pennsylvania.

It is hoped that an informed representative will be present for each showing of every film. In addition, each sponsor of a film is requested to provide a quantity of mimeographed sheets which will give a synopsis of the picture; any interesting facts as to its production or the use made of it; the length, time, etc.; whether or not the picture is available for loan, rental, or sale, and where.

An invitation is extended to owners of movies, especially those of 1936–1937 production, to offer their pictures for showing at the convention.

Please send full information as to the subject matter, and the size of the film. Quick action will secure the better hours for projection.

If possible each picture will be shown at the same hour on 2, 3, or 4 days. Please make a first and second choice of days and hours (9:00, 10:00, 11:00, etc.), the final choice resting with the committee in charge.

Address correspondence to Evart G. Routzahn, 130 East 22nd St., New York, N. Y.

YOUR CONTRIBUTION TO HEALTH EDUCATION AND PUBLICITY HEADQUARTERS

EVART G. ROUTZAHN will, as usual, conduct Health Education and Publicity Headquarters. He will have on display examples of all types of health education material gathered from near and far.

Invitations are issued to all who would like to make contributions to this impressive exhibit to communicate with Mr. Routzahn at once, at 130 East 22nd Street, New York, N. Y.

HEALTH CENTER OPENING MONDAY, OCTOBER 4

HEALTH Commissioner John L. Rice of New York City has arranged a pre-convention feature for Monday, October 4, to acquaint delegates with district health center development in New York City.

Dedication ceremonies of the Central Harlem Health Center in Manhattan's densely populated Negro district will be held at a luncheon meeting in the new building, 2238 Fifth Avenue, Monday noon, prior to convention sessions. New York's Mayor, Fiorello H. LaGuardia, and Commissioner Rice will outline the city's district health program which is launching 8 new city-owned, city-built health center buildings this year. A.P.H.A. leaders will be invited to participate in the ceremonies, and the Harlem building and its services will be open for inspection by delegates through convention week.

New York City's district health center program provides for the organization of 30 health center districts by 1945, to serve the city's approximately 7,500,000 people living in an area of about 300 square miles. In the 30 district plan, each administrative unit, under a full-time district health officer, would serve a population area of about 250,000. According to Dr. Rice, the district program is based on detailed studies by experts in preventive medicine and public health who hold that only such a program can bring the services of the health department of a large metropolis close to the people.

District health administration is an administrative device which should make possible the achievement of two objectives: first, to bring health services closer to the people who need them and thereby render more effective service; second, to discover local needs which tend to be concealed in statistics for an entire borough or city.

The Central Harlem building will be the 7th new district health center to be opened in New York's Boroughs of Manhattan, Brooklyn, Bronx, and Richmond this year. The 8th unit will be opened in the Borough of Queens on October 14. Construction plans are under way for additional units in the program.

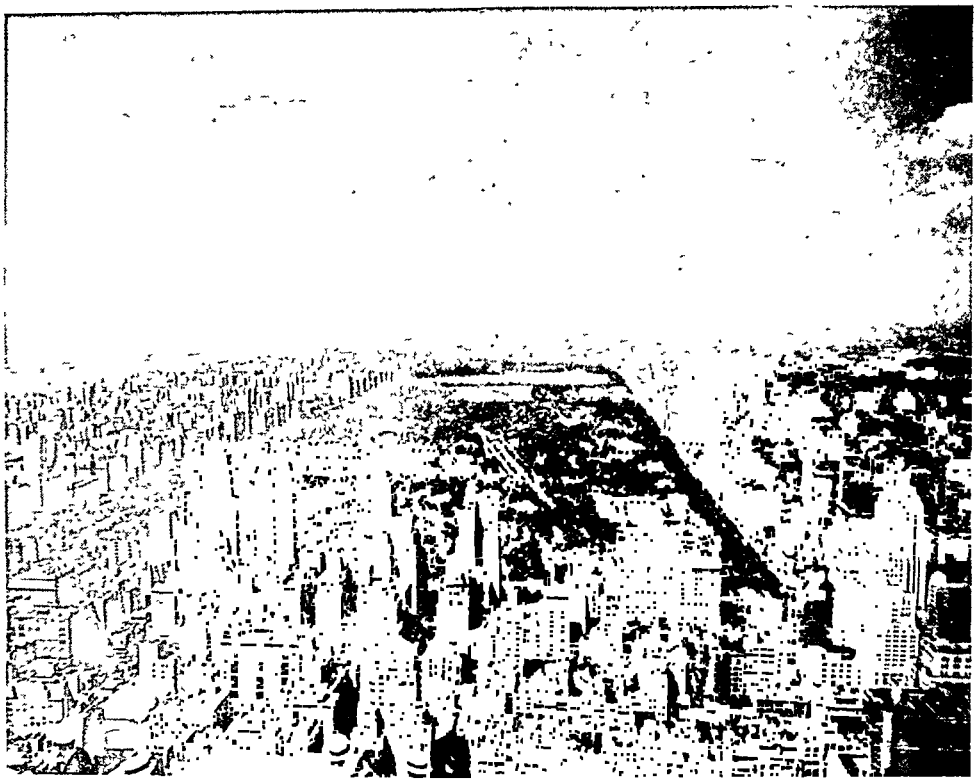
New York's district health program also provides for coöperation between the Department of Health and the 5 large medical schools operating in the city, for training physicians, nurses, and other public health workers in preventive medicine and public health practice. Five of the new district buildings will be health and teaching centers affiliated with the medical schools.

More than $2,000,000 in loans and grants obtained from the Federal Emergency Administration of Public Works, made possible the construction and equipment of the first 8 new health center buildings, which average $250,000 in cost.

At present, New York City has 20 health districts organized with district medical health officers in charge of each district health center. Some of these centers are housed in temporary quarters. The personnel in the district program is all under Civil Service.

THE HEALTH EDUCATION INSTITUTE OCTOBER 3, 4, AND 5

PLANS are rapidly progressing for the Fifth Health Education Institute, to be conducted by a committee of the Public Health Education Section and sponsored by the Association. The previous Institutes have been highly successful and practical. The program of the Fifth Institute aims to give the major objectives and principles of community health education, and to provide information about the various technics involved and the application of these methods in specific public health activities.



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Looking North from the Rockefeller Center Observatory



© Rockefeller Roof Studios

Night View from Rockefeller Center Observatory Looking South

The Institute will use a combination of the discussion and lecture methods adapted to group work. Recognizing the varied interests of members, the schedule is planned to give opportunity for those primarily interested in securing more information regarding a specific topic to participate in round table programs on this subject. Hence, there will really be a series of institutes running at the same time. General sessions are provided on the first day of the Institute for a consideration by all at the outset of the psychological principles of health education, and at the end of the Institute on the rounded community health program. The faculty has been carefully selected from leaders in this field who have had long practical experience in doing the job. An added feature will be the assembly by leaders in a unique manner of illustrative material, the use of professional exhibits, and of Mr. Routzahn's public health education and publicity exhibit for laboratory purposes. Each leader will have one or more consulting specialists as assistants.

The subjects of the round tables with the names of leaders follow:

Sunday, October 3, 10:00 A.M. General Session

a. Organization of Institute. Ira V. Hiscock, Professor of Public Health, Yale University, New Haven, Conn.

b. Psychological Principles of Health Education.

The first round tables will immediately follow this general session.

Subjects and Leaders

Personal and Group Contacts
Mary Connolly, Director of Health Education, Detroit Department of Health

Newspapers
Mary Swain Routzahn, Consultant in Social Work Interpretation, Russell Sage Foundation, New York, N. Y.

Meetings and Public Speaking
Philip P. Jacobs, Ph.D., Director of Publications and Extension, National Tuberculosis Association, New York, N. Y.

Printed Matter
Bertrand Brown, Consultant in Public Health Education, New York, N. Y.

Radio
Florence Marvyne Bauer, Author of Health Plays and Radio Dramas

Exhibits
Homer N. Calver, Secretary and Director, Committee on American Museum of Hygiene, American Public Health Association

Isotype and Campaign Methods (each a single session)
H. E. Kleinschmidt, M.D., Director of Public Health Training, Department of Health, New York, N. Y.

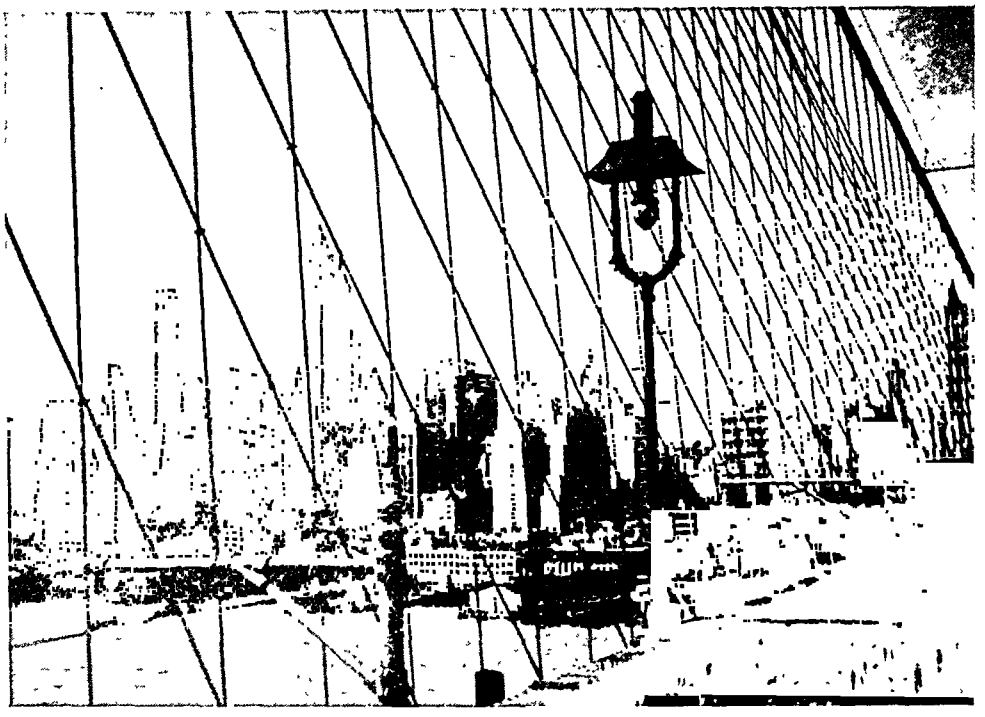
Moving Pictures
Arthur L. Gale, Editor, Movie Makers, New York, N. Y.

School, Elementary
Ruth E. Grout, Director of Health Education Study, Cattaraugus County School Health Service, Olean, N. Y.

School, Secondary
C. E. Turner, Dr.P.H., Professor of Biology and Public Health, Massachusetts Institute of Technology, Cambridge, Mass.

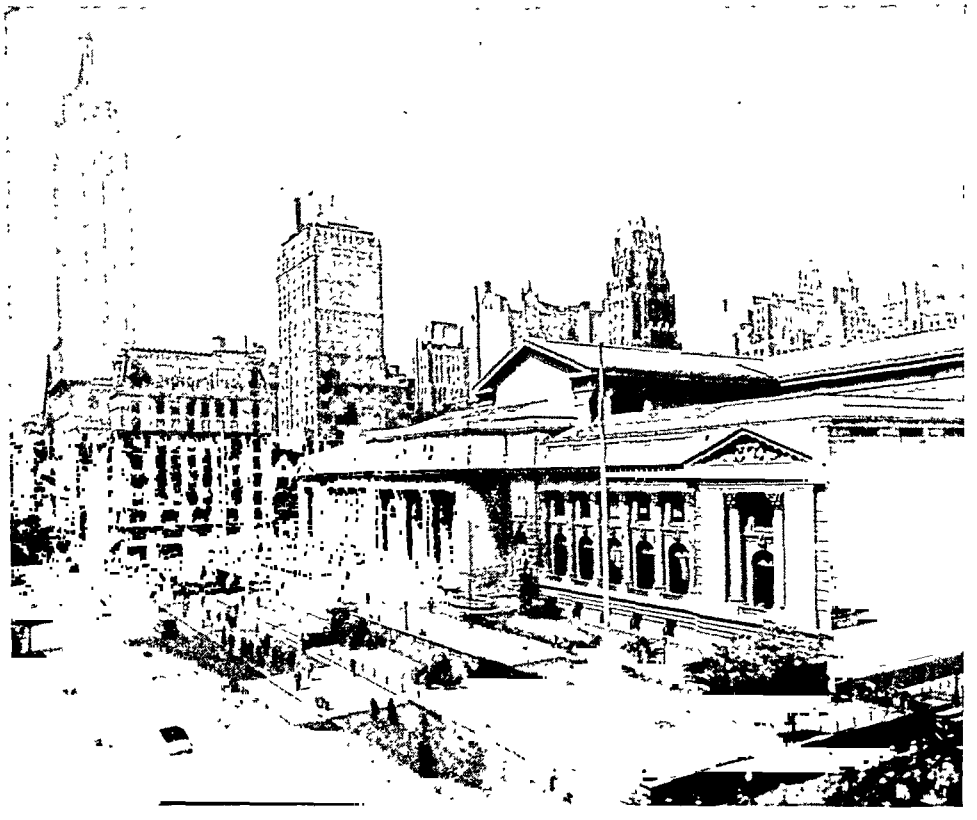
While it is expected that members will select one major subject for regular attendance, the sessions will be so arranged that those who are primarily interested in exhibits may attend the short sessions dealing with the Isotype Methods, and persons interested in contact methods and meetings may attend the session on Campaign Methods. The introductory sessions on personal and group contacts, exhibits and school will be open to members registering for the other sessions which begin Monday morning. One of the sessions on moving pictures will feature school films, and provision will be made for the school groups to attend. A Monday luncheon is being arranged for discussion of the Health Education Coördinator.

At the final general session, brief summaries of the various round tables will be presented by specialists, and the Institute will conclude with an address on the community health education program as a whole by Dr. George C.

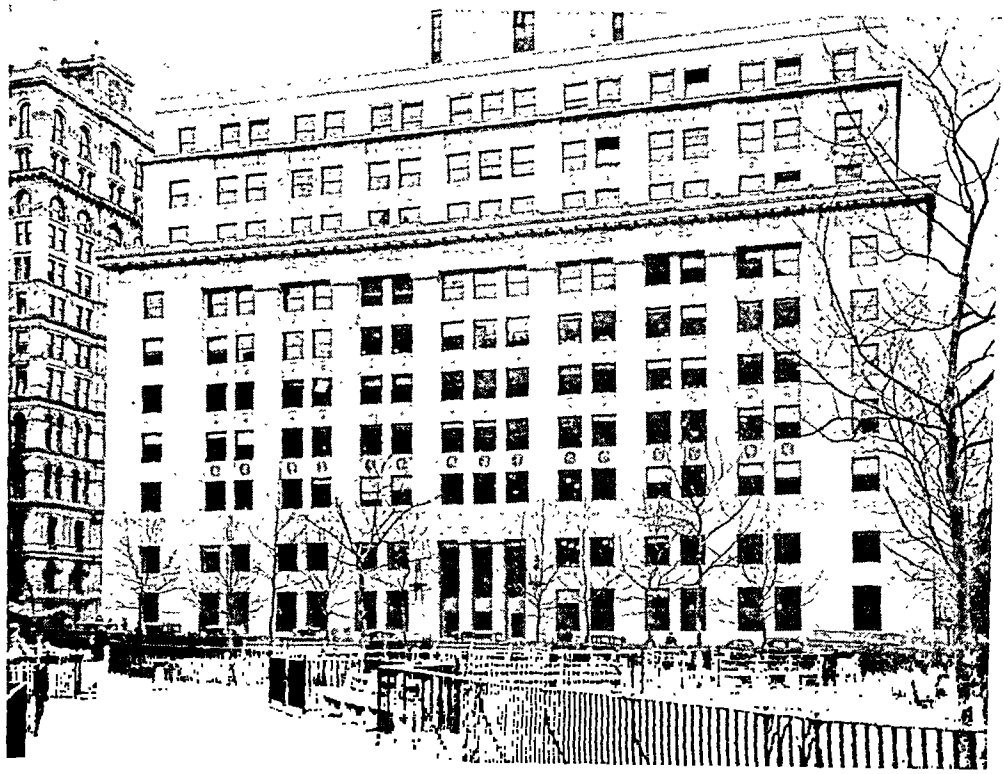


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An Unusual Picture of Lower Manhattan Taken from Brooklyn Bridge

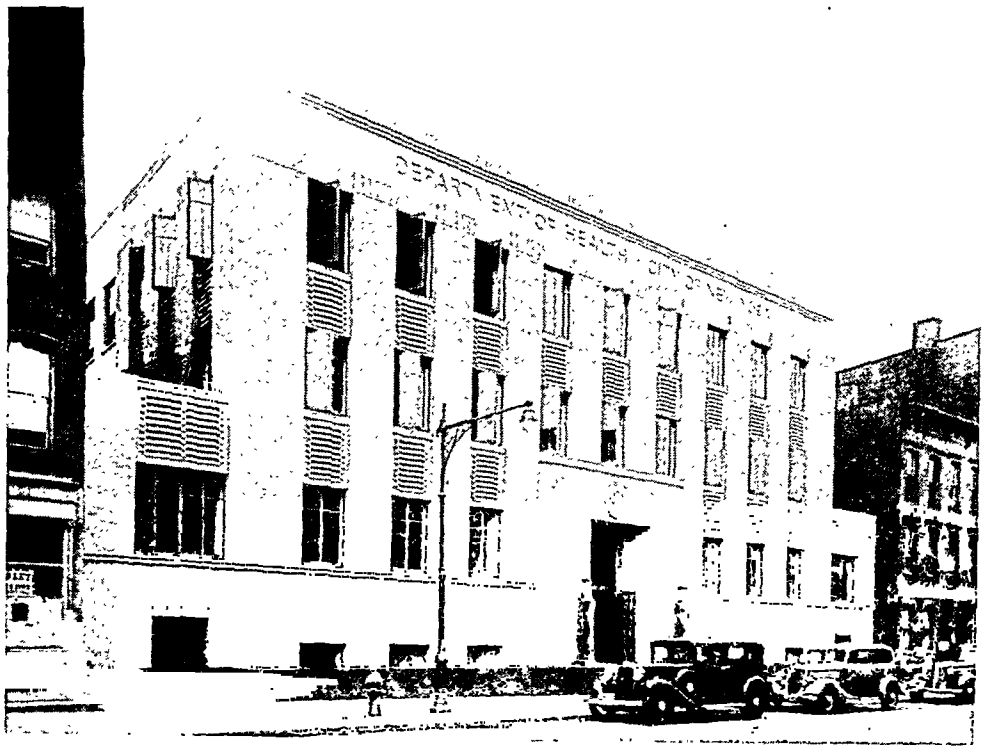


New York Public Library



Art Service Project WPA

Board of Health Building, New York, N. Y.



Williamsburg-Greenpoint Health Center, Brooklyn, N. Y. Opened July 27, 1937

Ruhland, Commissioner of Health, Washington, D. C. All of the sessions will be held in the Hotel New Yorker.

Those wishing to register for the Health Education Institute should do so at once. The fee is $3 for members of the Association, and $6 for non-members. Registration forms may be obtained from the Association office.

THE SCIENTIFIC EXHIBITS

ONE of the most notable features of the Annual Meeting which has been given tremendous stimulus in the past few years by the interest of members themselves is the Scientific Exhibit. The one developing for the New York City meeting is especially interesting. Applications are at hand covering a multitude of subjects, all of concern to the public health world at the present time.

Syphilis is well represented from many angles, with offers of exhibits from individuals and many agencies, including state health departments and the U. S. Public Health Service.

Among those to which space has already been allotted by the Scientific Exhibits Committee are:

Virus Diseases
Rockefeller Institute for Medical Research and Rockefeller Foundation

Syphilis
Group exhibit by the United States Public Health Service, American Social Hygiene Association and other agencies

Mechanical Nostrums
American Medical Association

Connecticut State Cancer Program

Activities of Metropolitan Health Department of Vancouver

Indiana State Board of Health Dental Program

Pneumonia Control
Drs. Cecil, Armstrong, and Dublin

Tuberculosis in Children
Queensboro Tuberculosis and Health Association

Eye Defects
National Society for the Prevention of Blindness

Health and Safety
Boy Scouts of America

Prevention of Frost Bite
Dr. Leopold Brahdy

Dental Diseases in Indigent Children of New York City
Murry & Leonie Guggenheim Foundation

Twenty-five Years of Public Health Nursing
National Organization for Public Health Nursing

Vital Statistics
American Association of State Registration Executives

Activities of New York State Health Department

THE TECHNICAL EXHIBITS

MORE than 100 of the country's outstanding business organizations are represented this year in the Health Exhibit. They are contributing, for the information of professional public health workers, a thoroughly comprehensive display of what is available commercially for health protection and promotion.

Delegates will want to plan their days so that they may spend as much time as possible examining the commercial exhibits. They are listed in the Directory of Exhibits in the advertising pages. All have a real reason for engaging the attention of a professional audience, and it is to the advantage of all public health workers to become well acquainted with the products on display and with the organizations sponsoring them.

THE AMERICAN PUBLIC HEALTH ASSOCIATION BOOK EXHIBIT

THE American Public Health Association will present again an exhibit of public health books from all the best publishing houses in the United States. More than 500 of the newer health books will be assembled on convenient shelves at a prominent location in the exhibit hall. A trained librarian will be in charge, ready and willing to answer questions about what is new

and what is good in every public health specialty.

Orders will be taken for later delivery by the Association's Book Service.

ENTERTAINMENT EVENTS

THE Local Committee, under the chairmanship of Dr. John L. Rice, Commissioner of Health of New York City, is arranging an entertainment program to suit the diverse tastes of the 4,000 delegates who are expected to attend the Annual Meeting. This will begin on Sunday, October 3, for the benefit of early arrivals in New York and the Health Education Institute students. The Local Committee will hold open house in the Pennsylvania Hotel that afternoon from 4:00 to 7:00, and all are invited to call and make the acquaintance of our hosts and hostesses.

As is traditional, there will be a reception to the retiring President Dr. Thomas Parran and Mrs. Parran, and to the incoming President Dr. Arthur T. McCormack and Mrs. McCormack, at the closing of the First General Session on Tuesday evening, October 5. Dancing will follow.

On Thursday afternoon, at which time no scientific meetings will be in progress, a harbor trip will be featured. This will give visitors an opportunity to see New York's far-famed waterfront and skyline. Music will be provided and refreshments served on the boat.

Special entertainment will be presented in connection with the annual banquet on Thursday evening, and two or three hours of good dance music will end the evening's festivities.

The Ladies' Entertainment Committee is scheduling a fashion show and tea, a garden trip, and a matinee, to keep wives of delegates busy while their husbands attend scientific meetings.

Optional trips to the Empire State Building, to Radio City, to New York's many museums, to the S.S. Normandie and S.S. Queen Mary, will be arranged.

In summary, the days and nights will be crowded with interesting and pleasant things to do and see in sufficient variety for every delegate to indulge his or her fancies and desires.

INVITATION TO VISIT THE NEW YORK STATE HEALTH DEPARTMENT

DR. EDWARD S. GODFREY, JR., Commissioner of Health of New York State, extends a cordial invitation to all delegates to the New York City meeting to visit the Department in Albany on Saturday, October 9, the day after the convention closes.

The day will be spent in inspecting Department activities. Dr. Godfrey generously offers to provide luncheon, as well as transportation in Albany.

Those who will find it possible to accept the invitation are asked so to inform Dr. George H. Ramsey, Assistant Commissioner, State Department of Health, Albany, N. Y.

POST CONVENTION CRUISE TO BERMUDA

A NOTIFICATION was mailed to the entire membership early in July, announcing a cruise to Bermuda on the Gdynia American Line M. S. Pilsudski.

The delegation will sail on Friday, October 8, returning to New York Wednesday, October 13.

Members who wish to take advantage of this unusually inexpensive and attractive cruise may do so upon immediate application to headquarters.

Accommodations begin at $50. Rooms with showers are $75.

Included in the rate is a get-together dinner on board the Pilsudski, Friday evening, a banquet to members of the Association followed by a Grand Ball and Entertainment on the boat in Bermuda, overnight in Bermuda using the vessel as a hotel.

Busses will leave the Hotel Pennsylvania, Friday, October 8, at 6:15 P.M. sharp. Passengers and baggage will be conveyed to the pier in Hoboken.

DINNER PLAN FOR HEALTH OFFICERS

ON Wednesday, October 6, at the Hotel Pennsylvania, the National Society for the Prevention of Blindness will be the host at a dinner given for state, county, and city health officers visiting New York City during the American Public Health Association meeting. The dinner will be the occasion for an informal discussion of "Possibilities for State Prevention of Blindness Developments Through Statewide Coöperation" by various health officers and members of the Inter-organization Committee on Sight Conservation which was organized to promote state prevention of blindness activities under health agency auspices. The following organizations are participating members on this committee:

American Public Health Association
American Public Welfare Association
Children's Bureau
National Society for the Prevention of Blindness
Social Security Board
State and Provincial Health Authorities of North America
U. S. Public Health Service

It is planned to send invitations to health officers some time in September in order that those who wish to attend the dinner may indicate their intention.

HOTEL RATES

	Room Capacity	*Rate per Day*				
		Single Room	*Double Bedded Room*	*Twin Bedded Room*	*Suite for One*	*Suite for Two*
Pennsylvania	2,000	$3.50 up	$5.00 up	$6.00 up	$11.00 up	$13.00 up
New Yorker	2,500	3.50	5.00	6.00		
McAlpin	1,300	2.50 up	4.00 up	4.50 up	8.00 up	10.00 up

.....(Cut off on this line and mail to the hotel of your choice).....

HOTEL RESERVATION BLANK FOR NEW YORK MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
50 WEST 50TH STREET, NEW YORK, N. Y.
OCTOBER 5–8, 1937

To
(Name of Hotel)

Please reserve for me rooms for persons for the A.P.H.A. Meeting.

Single room Double room

Maximum rate per day for room $..... Minimum rate per day for room $.....

I expect to arrive If date of arrival is changed I will notify you at least 24 hours in advance.

Please acknowledge this reservation.

Name

Street address

City State

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

W. B. Bruce, M.D., Court House, Helena, Ark., Medical Director, District No. 8

Roderick M. Buie, M.D., County Court House, Greensboro, N. C., Guilford County Health Officer

Horace DeLien, M.D., Rapid City, S. D., Pennington County Health Director

Manuel Diez Martinez, M.D., Rosales No. 48, Culiacan, Sin., Mexico, State Health Officer

Joseph L. Gayton, M.D., 2148 Daniel St., Trail, B. C., Canada, City Health Officer

Harvey J. Skarshaug, M.D., P. O. Box 1292, Fargo, N. D., City Health Officer

Courtney Smith, M.D., Hogg Bldg., Oregon City, Ore., Clackamas County Health Officer

John W. Tappan, M.D., 209 S. Campbell St., El Paso, Tex., Director, City-County Health Unit

Woodye A. Winter, M.D., Forrest City, Ark., Director, St. Francis County Health Unit

John J. Wright, M.D., Box 346, Erwin, Tenn., Assistant Director, Carter-Unicoi Health District

Laboratory Section

Eldon M. Boyd, M.D., Queen's University, Kingston, Ont., Canada, Assistant Professor of Pharmacology

Jessie M. Dewey, 4342 Drexel Blvd., Chicago, Ill., Junior Bacteriologist, Board of Health

Ernest Q. King, M.D., Ph.D., 920 E. Broadway, Salt Lake City, Utah, to instruct in public health laboratory methods at Kwong Wah Medical College, Canton, China

Grace L. McCallum, 2341 W. Grand Blvd., Detroit, Mich., Laboratory worker

Viola M. Michael, Ph.D., State Dept. of Public Health, Springfield, Ill., Diagnostic and Research work, Division of Laboratories

Delmar M. Rudig, 1180 E. 63 St., Chicago, Ill., Senior Bacteriologist, Board of Health Laboratories

Gregory B. Stolberg, 667 Madison Ave., New York, N. Y., Director, Stolberg Laboratories

Charles B. Waite, M.D., 296 Stewart St., Peterborough, Ont., Canada, Director, Branch Laboratory, Provincial Dept. of Health

Vital Statistics Section

Louis P. Hellman, State Dept. of Health, Albany, N. Y., Assistant Statistician, Bureau of Maternity, Infancy and Child Hygiene

Edward M. L'Engle, M.D., State Board of Health, Jacksonville, Fla., Director, Bureau of Vital Statistics

Robert T. Stimpson, M.D., C.P.H., State Board of Health, Raleigh, N. C., Director, Bureau of Vital Statistics

Public Health Engineering Section

Donald K. Harmeson, 3121–25 Ave., Rock Island, Ill., Sanitary Engineer, State Dept. of Public Health

Raymond J. Karpen, State Dept. of Health, Minneapolis, Minn., Assistant Sanitary Engineer, U. S. Army and State Dept. of Health

George S. Michaelsen, State Dept. of Health, Minneapolis, Minn., Assistant Sanitary Engineer

Earl H. Ruble, State Dept. of Health, Minneapolis, Minn., Assistant Sanitary Engineer

Frank Tetzlaff, C.E., Apartado 1244, Caracas, Venezuela, S. A., Sanitary Engineer for Government

Vernon L. Walker, State Health Dept., Springfield, Ill., Sanitary Engineer

Industrial Hygiene Section

Paul A. Brehm, M.D., No. 1 W. Wilson, Madison, Wis., Supervisor of Industrial Hygiene, State Board of Health

Food and Nutrition Section

Brady S. Johnston, 660 King St., Jacksonville, Fla., Vice-President, Dinsmore Dairy Co.

Mary Lenihan, 153 Beach 131 St., Belle Harbor, N. Y., Inspector of Foods, New York City Dept. of Health

Therese Olzendam, 420 Lexington Ave., New York, N. Y., Editorial Dept., J. Walter Thompson Co.

Robert C. Robertson, 120 South James, Carthage, N. Y., Inspector of Foods, New York City Department of Health

Child Hygiene Section

James M. Coleman, M.D., 812 Avondale Rd., Austin, Tex., Field Director, Division of Maternal and Child Health, State Dept. of Health

Helen Elston, M.D., 515 Walnut St., Elmira, N. Y., School Inspector

Morna Weltman, 1800 Fillmore St., Chicago, Ill., Instructor in Health and Nutrition, Jewish Social Service Bureau of Chicago

Public Health Education Section

Ida M. Finch, R.N., Chamber of Commerce Bldg., Auburn, N. Y., Executive Secretary, Cayuga County Committee on Tuberculosis and Public Health

Beulah France, R.N., 440 Riverside Drive, New York, N. Y., Health Education Consultant

Adele E. Yoe, 1143 Cherokee Rd., Louisville, Ky., Director, Health Education, Dept. of Health

Public Health Nursing Section

E. Blanche Harstine, 760 W. Euclid, Detroit, Mich., Special Supervisor, Tuberculosis Nursing Division, Dept. of Health

Ann Hauser, Richmond, Mo., County Nurse, Ray County Public Health Service

Frances R. Kahl, R.N., Rm 314, U. S. Court House, Chicago, Ill., Regional Public Health Nursing Consultant, U. S. Public Health Service

Amalia G. Krause, R.N., 26 Front St., Pontiac, Mich., Public Health Nurse, Oakland County Health Dept.

Mabel L. King, R.N., Box 17, Old Capitol, Jackson, Miss., Orthopedic Nurse, Crippled Children's Service

Bertha C. B. McClendon, R.N., Lewisville, Ark., Lafayette County Public Health Nurse, State Board of Health

Rosalie I. Peterson, 1713 N. Troy St., Clarendon, Va., Associate Public Health Nursing Consultant, U. S. Bureau of Indian Affairs

Margaret T. Ritchie, R.N., 18 E. Garfield St., Phoenix, Ariz., Nurse, Maricopa County Health Unit

Epidemiology Section

Arthur Burns, M.D., State Dept. of Health, Austin, Tex., Director, Division of Tuberculosis

Charles Goodman, M.D., 745 Fifth Ave., New York, N. Y., Director, Typhus Research Fund, New York University Medical School

Unaffiliated

Maurice Mereness, 300 Del St., Walton, N. Y., Inspector of Food, New York City Dept. of Health

Paul R. Swift, 40 Jackson St., Montrose, Pa., Inspector of Foods, New York City Dept. of Health

DECEASED MEMBERS

Harrison P. Eddy, Boston, Mass., Elected Member 1910, Fellow 1924

Wilder D. Hubbard, M.D., Florence, Ala., Elected Member 1925

John F. O'Donnell, Kansas City, Mo., Elected Member 1935

APPLICANTS FOR FELLOWSHIP

(Other names listed in August Journal)

IN accordance with the By-laws of the Association, the names of applicants for Fellowship are officially published herewith. They have requested affiliation with the Sections indicated. Action by the various Section Councils, the Committee on Fellowship and Membership, and the Governing Council will take place between now and the time of the New York City Annual Meeting.

Health Officers Section

Walter L. Bierring, M.D., State Commissioner of Health, Des Moines, Ia.

Angel de la Garza Brito, M.D., C.P.H., Chief, General Office of Rural Hygiene, Federal Department of Health, Mexico City, Mexico

Charles H. Eller, M.D., Dr.P.H., Director of Rural Health, State Department of Health, Richmond, Va.

Frank C. Cady, D.D.S., C.P.H., Dental Consultant to State Health Authorities, U. S. Public Health Service, Washington, D. C.

T. O. Crawford, M.D., Health Officer, Dewey, Okla.

George E. Taylor, M.D., Health Officer, Hornell, N. Y.

Laboratory Section

William E. Bunney, M.Sc., Ph.D., Associate Director, Bureau of Laboratories, State Department of Health, and Instructor in Public Health, Wayne College of Medicine, Lansing, Mich.

Marion B. Coleman, B.S., Senior Bacteriologist, State Department of Health, Albany, N. Y.

Elliott H. Parfitt, Ph.D., Associate Professor of Dairy Bacteriology, Purdue University, Lafayette, Ind.

Emil Weiss, M.D., Ph.D., Special Consultant, U. S. Public Health Service, and Associate in Bacteriology and Public Health, College of Medicine, University of Illinois, Chicago, Ill.

Rhoda W. Benham, Ph.D., Assistant Professor of Dermatology, Columbia College of Physicians and Surgeons, New York, N. Y.

Sara E. Branham, M.D., Sc.D., Senior Bacteriologist, U. S. Public Health Service, Washington, D. C.

F. Wellington Gilcreas, A.B., Associate Sani-

tary Chemist, Division of Laboratories and Research, State Department of Health, Albany, N. Y.

K. George Falk, Ph.D., Director, Laboratory of Industrial Hygiene and Biological Chemist, Bureau of Laboratories, Department of Health, New York, N. Y.

Julia M. Coffey, A.B., Associate Bacteriologist, Division of Laboratories and Research, State Department of Health, Albany, N. Y.

Herbert E. McDaniels, Ph.D., Chief, Division of Laboratories, State Department of Health, Springfield, Ill.

Martin Frobisher, Jr., Sc.D., Director of Laboratories School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.

John T. Myers, M.D., Assistant Director, Bendiner & Schlesinger, Inc., New York, N. Y.

Vital Statistics Section

Joseph Berkson, M.D., D.Sc., Head, Division of Biometry and Medical Statistics, Mayo Clinic and Associate Professor of Biometry and Statistics, University of Minnesota, Rochester, Minn.

Public Health Engineering Section

Herman G. Baity, S.D., S.B. in C.E., Professor of Sanitary Engineering, University of North Carolina, Chapel Hill, N. C.

James L. Barron, C.B., Director, Division of Sanitation, Westchester County Department of Health, White Plains, N. Y.

Lewis V. Carpenter, M.S.C.E., Professor of Sanitary Engineering, New York University, New York, N. Y.

Carl E. Green, A.B. in C.E., State Sanitary Engineer, State Board of Health, Portland, Ore.

Edward D. Hopkins, Senior Sanitary Engineer, Pan-American Sanitary Bureau, Washington, D. C.

Harold F. Gray, M.S., Lecturer on Public Health, University of California, and Consulting Sanitary Engineer, Berkeley, Calif.

Archie B. Freeman, M.S., Assistant Engineer, State Board of Health, Raleigh, N. C.

Earl Devendorf, M.S., Associate Director, Division of Sanitation, State Department of Health, Schenectady, N. Y.

Anselmo F. Dappert, M.S. in S. & M.E., Principal Sanitary Engineer, State Department of Health, Albany, N. Y.

Carl J. Lauter, M.S., Chief Chemist, Filtration Plants, U. S. Engineers Office, War Department, Washington, D. C.

John Oberwager, M.D., Director, Sanitary Bureau, Department of Health, New York, N. Y.

Industrial Hygiene Section

S. Edward King, M.D., Medical Director, Stewart Cafeterias, New York, N. Y.

Food and Nutrition Section

Mervyn B. Starnes, D.V.M., Chief, Division of Inspection and Sanitation, Department of Public Health, Dallas, Tex.

Public Health Nursing Section

Elizabeth S. Soule, M.A., Director, School of Nursing, University of Washington, Seattle, Wash.

Marion H. Douglas, B.S., C.P.H., Executive Director, Hartford Visiting Nurse Association, Hartford, Conn.

Ethel G. Brooks, B.S., R.N., Director, Nursing Service and Executive Secretary, Wheeling Chapter, American Red Cross, Wheeling, W. Va.

Epidemiology Section

H. Trendley Dean, D.D.S., Dental Surgeon, U. S. Public Health Service, Washington, D. C.

Bruce H. Douglas, M.D., Controller of Tuberculosis, Department of Health, Herman Kiefer Hospital, Detroit, Mich.

Nels A. Nelson, M.D., Director, Division of Genito-Infectious Diseases, State Department of Health, Boston, Mass.

Esmond R. Long, M.D., Ph.D., Director, Henry Phipps Institute, University of Pennsylvania, Philadelphia, Pa.

Unaffiliated

Paul B. Cornely, M.D., Dr.P.H., Associate Professor, Howard University, Medical School, Washington, D. C.

Jose P. Bill, M.D., Dr.P.H., Assistant Professor of Public Health, Boston University, School of Medicine, Boston, Mass.

Harley J. Powell, M.D., Wood County Health Commissioner, Bowling Green, Ohio

STANDARD METHODS OF MILK ANALYSIS

THE committee has made progress during the year on the preparation of the manuscript for the new edition of *Standard Methods of Milk Analysis,* and will have much new material of real importance in spite of the fact that the committee decided yesterday not to recommend a change in the formula for standard agar or 32° incubation as yet. In the new manuscript, the committee is recommending the use of the Quebec colony counter; the new methylene blue thiocyanate tablets are accepted as standard; the coliform technic has been clarified considerably; methods for detecting brucella and tuberculosis organisms are included on a tentative basis; and an improved technic for determining the sterility of milk bottles and other containers is included as well as many other improvements.

In the section dealing with coliform organisms, formate ricinoleate broth and brilliant green broth have both been accepted. Violet-red bile agar and desoxycholate agar are approved for plating work.

While all members of the milk committee are agreed that it is desirable to use an improved agar and introduce 32° incubation, they felt it better to defer action on these matters until a further comparative study of formulae for improved agars could be carried out under the supervision of a referee. We found ourselves to be more nearly in harmony than we were a year ago in regard to the formula that should be used, but it was felt desirable to go slowly and conservatively, and to make sure that the formula chosen would be satisfactory for use for a long period of time. Because public health milk laboratories find it difficult to get adequate equipment for milk work, it was also felt desirable to ask a referee to study the problem of preparing directions for the construction of inexpensive incubator rooms and incubators that can be operated satisfactorily at 32° C.

The incubator matter is to be referred to Dr. R. V. Stone who is acting for the committee as a Referee for development of new apparatus, and Dr. C. N. Stark, who has made a study of the construction of laboratory size incubators, is to be asked to work with him as Associate Referee. Suggestions concerning some interested and capable public health man who would act as an impartial referee in carrying out a comparison of formulae for improved agars were requested. The appointment of C. A. Abele, Director of the Division of Milk Inspection for the State of Alabama, was suggested. (July 30—It seems probable that Mr. Abele will undertake this commission, and his name will soon be presented to Dr. A. P. Hitchens with a recommendation that he be appointed a Referee to undertake this work.)

A suggestion was made by Dr. Norton that the new milk report have an index as well as a Table of Contents.

It was voted that, subject to editorial revision, the manuscript of the new (7th) edition of *Standard Methods for the Examination of Dairy Products* be approved for presentation to the Laboratory Section at the Annual Meeting in October. While this manuscript includes many changes, the formula for standard agar as given is the old formula and the incubation temperature is still given as 37° C.—Excerpt from Minutes of Meeting of the Coördinating Committee on Standard Methods, A.P.H.A., Tuesday morning, July 29, 1937.—A. Parker Hitchens, *Chairman.*

NEWS FROM THE FIELD

NEWSPAPERS AND VENEREAL DISEASE CONTROL

THE importance of syphilis and gonorrhea as public health problems and the power of the press as an educational factor in the control of these diseases have again been recognized with the award, by the Pulitzer Prize Committee, of honorable mention to the *New York Daily News* for "the most disinterested and meritorious public service rendered by any American newspaper during the year" 1936.

The *News* was cited "for its campaign covering venereal diseases and prophylaxis" — notably a series of straightforward, authentic articles written by Carl Warren, a reporter on the *News* staff, which set forth specifically and in plain language the facts about prevalence, symptoms, treatment, clinics and quackery. The entire series was submitted to and approved by a group of specialists in venereal disease control prior to publication.

Popular response to these articles, as noted in the June issue of the *Health Officer,* published by the U. S. Public Health Service, suggests not only the universal need for such publicity but also the widespread desire among the people themselves for knowledge on the subject. From persons in all walks of life in this country and abroad, the *News* received hundreds of letters, all congratulatory, asking for more information. Many wanted facts about clinics and physicians while others asked about preventive measures. One of the most tangible results was the marked increase in the number of examinations made at the New York City clinics and by private physicians. During the first three months of 1937, compared with the corresponding period of 1935, 82 per cent more persons were examined at the clinics conducted by the City Bureau of Social Hygiene; 47 per cent more patients were treated for syphilis; 321 per cent more patients were treated for gonorrhea, and there were 126 per cent more visits for treatment.

The *News* followed up the articles with editorials, cartoons and spot news stories. Along with other newspapers, it covered local, regional and national conferences of public health officials and scientists on social hygiene. Particularly significant is the fact that new developments in this field now are handled by staff reporters as routine city desk assignments.

According to an estimate by William F. Snow, M.D., general director of the American Social Hygiene Association and special consultant to the U. S. Public Health Service, 50 per cent of the daily newspapers in the United States and a dozen leading magazines have carried articles, editorials, and cartoons on venereal diseases during the last year.

The local health officer can ease his own task considerably and at the same time render a genuine service to his community by enlisting the support of the local press in his efforts to bring to the people the facts that they should have about syphilis and gonorrhea.— *Health News,* State Dept. of Health, Albany, N. Y., July 26, 1937.

DISTRICT OF COLUMBIA NEWS

Gallinger Hospital, a general hospital of the District of Columbia, has been transferred from the Board of Public Welfare to the Department of Health, together with the tuberculosis sanatoria of the District.

George C. Ruhland, M.D., Health Officer of the District, has announced

that the building of a district health center at a cost of $200,000 has been authorized with the expectation that there will be need for three or four such centers in districts where there are no hospitals or out-patient facilities and where the health problems are greatest. Also in preparation are plans for a municipal center where the Health Department hopes to find a home.

Dr. Ruhland also announced a health demonstration in an area of the District of Columbia that has a bad health and mortality record. The population of this district is roughly 100,000. He states that the service to be developed in this district will be established on the basis of the standards recommended by the American Public Health Association.

ANTHRAX OUTBREAK

IN late July there was a serious outbreak of anthrax in southeastern South Dakota. The infection appears to be in virulent form and has been spreading rapidly. In some districts cases have been reported on almost every farm, and a large number of cattle and horses have died of the disease. The livestock sales agencies have had to cease operations in some counties during the emergency, and where the disease is at its worst state officials have stopped all traffic in livestock.

Local, state, and federal veterinarians are assisting with the control work which calls for the immunizing of stock not yet affected, the burial or burning of carcasses of animals that have died of the disease, early detection of unreported cases, and attending to quarantine regulations.—*Release,* U. S. Dept. of Agriculture, Aug. 3, 1937.

UNIVERSITY OF NEBRASKA COURSE

THE University of Nebraska, Lincoln, Nebr., announces the establishment of a Graduate School of Social Work which will open September 15, 1937.

For information, write the Director, Ernest F. Witte.

LEPROSY CONFERENCE

ARRANGEMENTS are being made to hold the Fourth International Leprosy Conference in Cairo, beginning March 21, 1938. This conference is being organized by the International Leprosy Association, and this will be the first International Conference to be arranged by this association since its inauguration in 1931. Three previous conferences of this nature have been held—at Berlin in 1897, at Bergen in 1909 and at Strassbourg in 1923.

The Egyptian Government is inviting all countries concerned to send official delegates. In addition to these, doctors and others interested in the subject are invited to be present. Full information can be obtained from the Secretary of the International Leprosy Association, 131 Baker Street, London, W.1.

EDUCATIONAL BROADCASTING CONFERENCE

THE Second National Conference on Educational Broadcasting has been announced for Chicago, Illinois, November 29, 30, and December 1. The American Public Health Association is one of the sponsors of this Conference.

The Objectives, as announced, are as follows:

To provide a national forum where interests concerned with education by radio can come together to exchange ideas and experiences; to examine and appraise the situation in American broadcasting as a background for the consideration of its present and future public service; to examine and appraise the listeners' interest in programs that come under the general classification of public service broadcasting; to examine the present and potential resources of education through radio; to examine and appraise the interest of organized education in broadcasting; to bring to a large and influential audience the findings that may become available from studies and researches in the general

field of educational broadcasting, particularly such studies and researches as may be conducted by the Federal Radio Education Committee.

SEVENTH CRUISE CONGRESS

THE Pan American Medical Association announces that it has chartered the S.S. Queen of Bermuda for its Seventh Cruise Congress to Havana and the West Indies, sailing from New York January 15, 1938, and returning January 31.

The main part of the Congress will be held in Havana, where there will be three days of scientific sessions with operative clinics. These will be divided into sections for the various medical and dental specialties. Meetings will be arranged with colleagues at other ports of call.

Applications should be addressed to the Pan American Medical Association, 745 Fifth Avenue, New York, N. Y.

GENITOINFECTIOUS DISEASES DIVISION

ON July 1, the Sub-division of Gonorrhea and Syphilis in the Division of Communicable Diseases of the Massachusetts Department of Public Health was made a separate Division of Genitoinfectious Diseases, with Nels A. Nelson, M.D.,† as Director.

AMERICAN HOME ECONOMICS ASSOCIATION

RESOLUTIONS ADOPTED AT ANNUAL MEETING, KANSAS CITY, MISSOURI, JUNE 21–24, 1937

WHEREAS, all home economics is directed toward a common goal, namely the improvement of personal and family living and activities growing out of them;

Be it resolved that the chairmen of departments of the Association devote a portion of their programs to the presentation of the common purpose and to a consideration of the social significance of their particular field of work to the ultimate objective of home economics.

WHEREAS, health education in the schools is rightly a coöperative program;

Be it resolved that school administrators be urged to provide for participation of home economics teachers in those phases of health education in which they are best qualified to give instruction.

WHEREAS, the school lunchroom is an important factor in child health and growth, and whereas its administration requires a scientific knowledge of nutrition and professional training in institution administration;

Be it resolved that school administrators be urged to secure supervision of the school lunchroom by trained persons on a professional rather than a commercial basis.

ELI LILLY COMPANY PRIZE

THE American Association for the Advancement of Science has awarded the first Theobald Smith Prize of $1,000, established by the Eli Lilly Company of Indianapolis, to Dr. Robley D. Evans, Assistant Professor of Physics at the Massachusetts Institute of Technology, for his method of detecting radium poisoning.

DEATHS

CHARLES A. BENTZ, M.D.,* Director of the Division of Communicable Diseases, Department of Health, of Buffalo, N. Y., died July 25. He was actively interested in the development of public health laboratory facilities and in the maintenance of high standards of service. Since 1923, he had been Director of the

† Member A.P.H.A., * Fellow A.P.H.A.

Bacteriological Laboratories of the Buffalo Department of Health, which also provides laboratory service for Erie County, and during the past 7 years had directed the work of the J. N. Adam Memorial Hospital Laboratory at Perrysburg, N. Y.

PERSONALS

ABEL WOLMAN,* Chief Engineer of the Maryland State Department of Health, has been appointed Professor of Sanitary Engineering at Johns Hopkins University.

CHARLES E. GILL, M.D.,† formerly in the Division of Tuberculosis of the Massachusetts Department of Public Health, has been appointed District Health Officer for the North Metropolitan District of Massachusetts, to succeed the late CHARLES B. MACK, M.D.

FRANK C. CADY, D.D.S.,† Dental Surgeon, U. S. Public Health Service, has recently completed a course in public health administration at Harvard and a special course in school health education and administration at the Massachusetts Institute of Technology, and has been assigned as Consultant to the State Health Authorities on the organization and administration of dental health service in connection with the Social Security Program.

DR. THOMAS B. PHINIZY, of Augusta, who has been Acting Commissioner of Public Health of Richmond County, Ga., for the past year, has been appointed Commissioner, effective July 15.

CARL C. DAUER, M.D., M.P.H.,* Assistant Professor of Preventive Medicine of Tulane University Medical School, New Orleans, La., has resigned to become Assistant Epidemiologist in the Health Department of the District of Columbia.

GEORGE HAYS, M.D.,† recently Director of Local Health Administration and Acting Director of Maternal and Child Health of the Arizona State Board of Health, has been appointed City Health Officer of Flint, Mich., effective July 16.

SARA E. BRANHAM, M.D., PH.D.,† Senior Bacteriologist of the U. S. Public Health Service, Washington, received the Honorary degree of Doctor of Science from the University of Colorado recently, in recognition of her contributions to bacteriology in relation to public health.

MELVIN P. ISAMINGER, DR.P.H.,* Professor of Hygiene, Oregon State College, Corvallis, Oregon, has resigned to become Chief of the Bureau of Public Health Information of the District of Columbia Health Department. Dr. Isaminger is a graduate of the University of Michigan and formerly of the Department of Health in Detroit.

WILLIAM GROSSMAN, M.D.,† of Richmond, has been appointed Epidemiologist in the Bureau of Communicable Diseases of the Virginia State Health Department.

JAMES N. DUDLEY, M.D.,† formerly of Danville, Va., has been named Health Officer of Northampton County with headquarters at Eastville, succeeding DR. HUGH B. MAGILL, JR.

FRANCIS E. HARRINGTON, M.D.,† City Health Commissioner of Minneapolis, Minn., has been appointed Acting Superintendent of the Minneapolis General Hospital.

EDWARD M. L'ENGLE, M.D.,† of Jacksonville, formerly a member of the Florida State Board of Health, has been appointed Registrar of the Bureau of Vital Statistics of the Board, succeeding STEWART G. THOMPSON, D.P.H.,* resigned.

* Fellow A.P.H.A.
† Member A.P.H.A.

CONFERENCES AND DATES

American Public Health Association—Sixty-sixth Annual Meeting. New York, N. Y. October 5–8.

MEETINGS OF THE FOLLOWING RELATED ORGANIZATIONS:

American Association of School Physicians. Annual Meeting in conjunction with Annual Meeting of the American Public Health Association. Hotel Pennsylvania, New York, N. Y. October 5–8.

American Association of State Registration Executives. McAlpin Hotel, New York, N. Y. October 5–8.

American Statistical Association—Biometric Section. McAlpin Hotel, New York, N. Y. October 8.

Association of Women in Public Health. Hotel Pennsylvania, New York, N. Y. October 6.

Conference of State Sanitary Engineers. Hotel Pennsylvania, New York, N. Y. October 5–6.

Delta Omega. McAlpin Hotel, New York, N. Y. October 6.

Federation of Sewage Works Associations. Hotel Pennsylvania, New York, N. Y. October 8.

National Organization for Public Health Nursing—Course Directors. Hotel Pennsylvania, New York, N. Y. October 7.

National Society for the Prevention of Blindness. Hotel Pennsylvania, New York, N. Y. October 6.

Public Health Association of New York City. Governor Clinton Hotel, New York, N. Y. October 5.

Academy of Physical Medicine—Fifteenth Annual Meeting. Hotel Walton, Philadelphia, Pa. October 19–21.

American Association of Railway Surgeons. Chicago, Ill. September 20–22.

American College of Surgeons. Chicago, Ill. October 25–29.

American Congress of Physical Therapy. Cincinnati, Ohio. September 20–24.

American Dietetic Association—Twentieth Annual Meeting. John Marshall Hotel, Richmond, Va. October 18–21.

American Hospital Association. Atlantic City, N. J. September 13–17.

American Institute of Nutrition. Baltimore, Md. Spring, 1938.

American Roentgen Ray Society. Chicago, Ill. September 13–17.

American Society of Sanitary Engineers. Washington, D. C. September 7–10.

American Water Works Association. New Orleans, La. April 25–28, 1938.

Association of Dairy, Food and Drug Officials of the United States. Raleigh Hotel, Washington, D. C. October 26–29.

Biennial Conference of the National Association for Nursery Education. Theme: Safeguarding the Early Years of Childhood. Nashville, Tenn. October 20–23.

Fifth International Congress of Radiology. Chicago, Ill. Sept. 13–17.

Fifth International Heating and Ventilating Exposition. Grand Central Palace, New York, N. Y. January 24–28, 1938.

International Association of Milk Dealers. Dallas, Tex. Oct. 21–23.

International Association of Milk Sanitarians. Brown Hotel, Louisville, Ky. October 11–13.

Iowa Public Health Association. Des Moines, Ia. May, 1938.

Medical Library Association. Boston, Mass., May, 1938.

Michigan Public Health Association. Lansing, Mich. November 10–12.

Mississippi Valley Medical Society. Quincy, Ill. September 29, October 1.

National Association of Educational

Broadcasters. Urbana, Ill. September 13–14.

National Conference of Social Work. Seattle, Wash. June 26–July 2, 1938.

National Warm Air Heating and Air Conditioning Association. New York, N. Y. January 24–26.

New England Milk Producers Association. Boston, Mass. October 26–27.

New England Sewage Works Association. Worcester, Mass. October 1–2.

New England Water Works Association. Poland Springs, Me., September 21–24.

New York State Association of Dairy and Milk Inspectors. Hotel Utica, Utica, N. Y. September 22–24.

New York State Conference on Social Work. New York, N. Y. October 19–22.

New York State Health and Physical Education Association. Syracuse, N. Y. December, 1937.

Ohio Conference of Sewage Operators. Cincinnati, Ohio. October 19–20.

Ontario Hospital Association. Toronto, Ont. October 21–23.

Pacific Coast Accident Prevention Conference. San Francisco, Calif. September.

Pan American Medical Association—Seventh Cruise Congress to Havana. (Pan American Medical Association, 745 Fifth Avenue, New York, N. Y.) January 15–31, 1938.

Pennsylvania State Organization for Public Health Nursing. Altoona, Pa. October 28.

Radiological Society of North America. Chicago, Ill. September 13–17.

Rocky Mountain Sewage Works Association. Santa Fe, N. M. September 20–22.

Second National Conference on Educational Broadcasting. Chicago, Ill. November 29, 30, December 1.

West Virginia State Health Conference. Charleston, W. Va. November 8–10.

Southern Medical Association. New Orleans, La. November 28.

FOREIGN

Fourth International Pediatric Congress. Rome, Italy. September 24–30.

Second International Congress for the Protection of Infancy. Rome, Italy. October 4–8.

Congress of Physiologists. Paris. October 11–13.

Institute of Sewage Purification. London. November 19.

Hawaii Territorial Medical Association. Honolulu, T. H. May, 1938.

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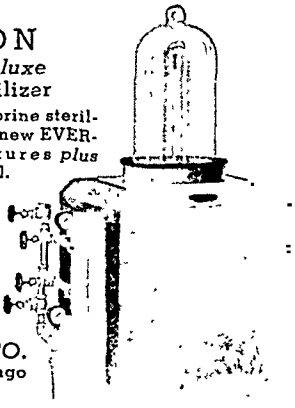
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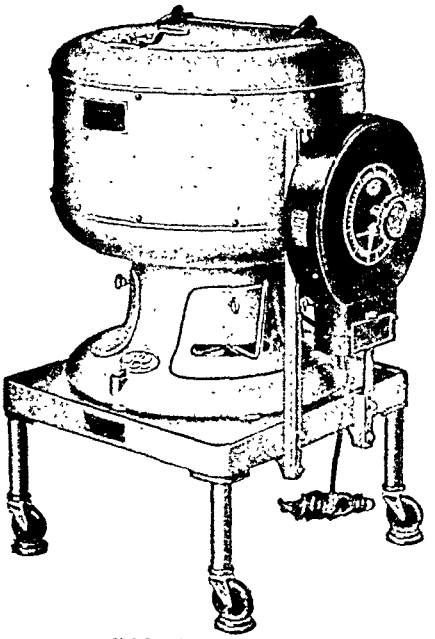
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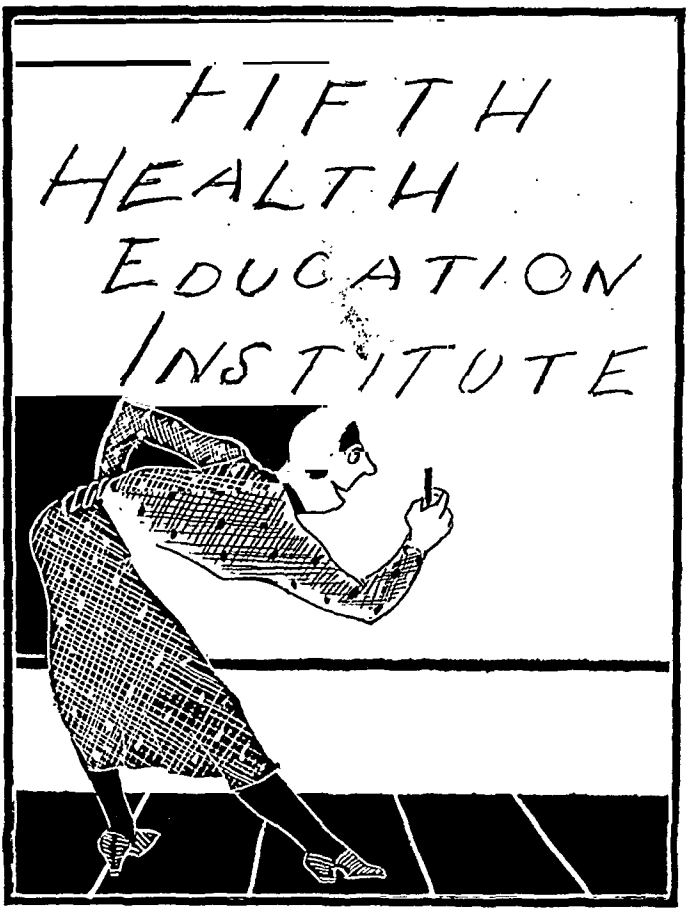
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LABORATORY

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Application blanks may be secured by writing to the Director, Illinois Department of Health, Springfield, Ill. All applications must be received by September 15, 1937. Acceptable applicants will be informed by mail as to the specific date of the examination.

The determination of qualifications for the position will be based on the standards as appearing in Appendix A, Supplement No. 126, The Public Health Program under title VI of the Social Security Act as published by the U. S. Government Printing Office, Washington, 1937. Frank J. Jirka, M.D., Director, Illinois Department of Health.

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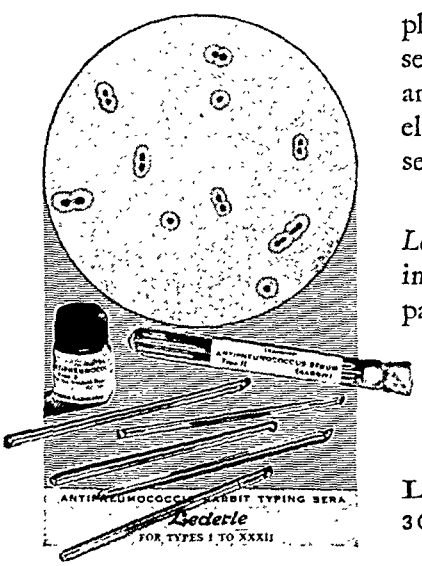
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American Journal of Public Health
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Official Monthly Publication of the American Public Health Association

Volume 27 — October, 1937 — Number 10

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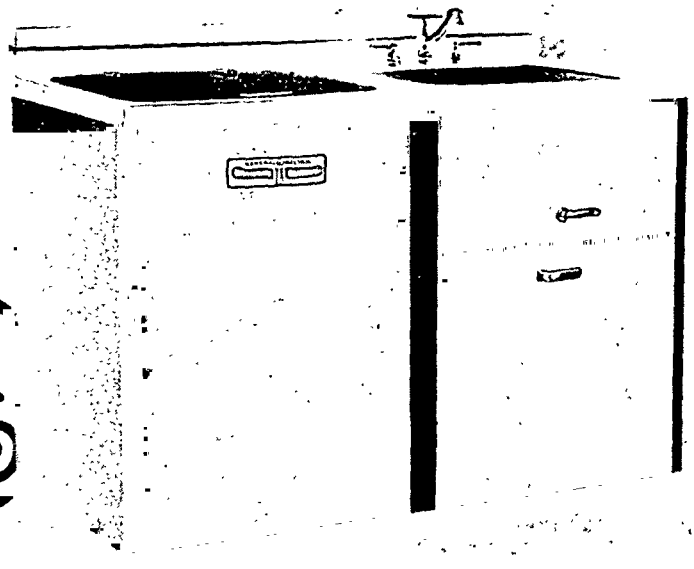
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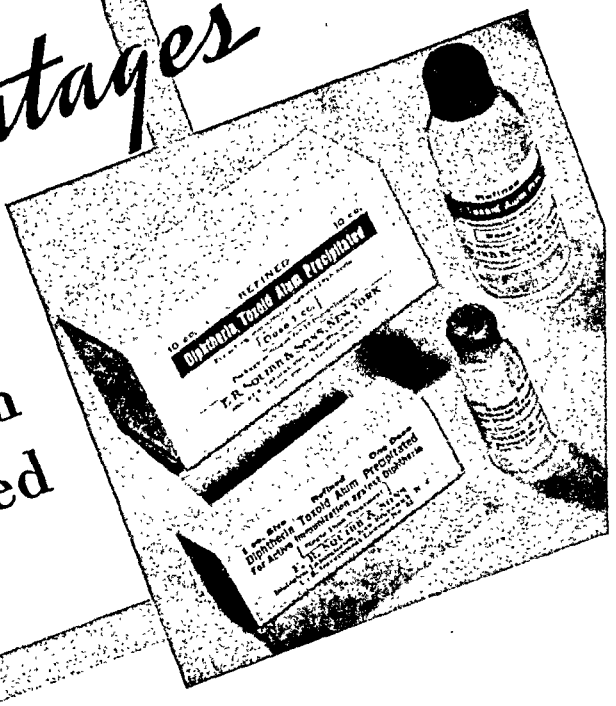
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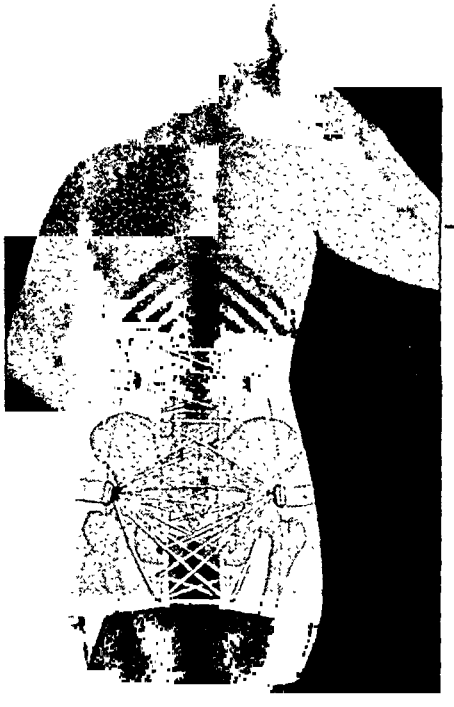
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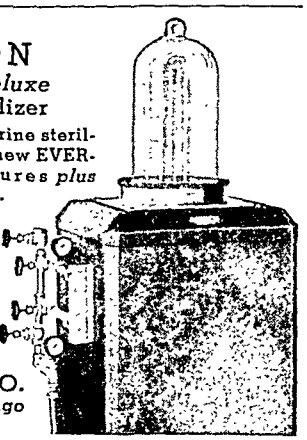
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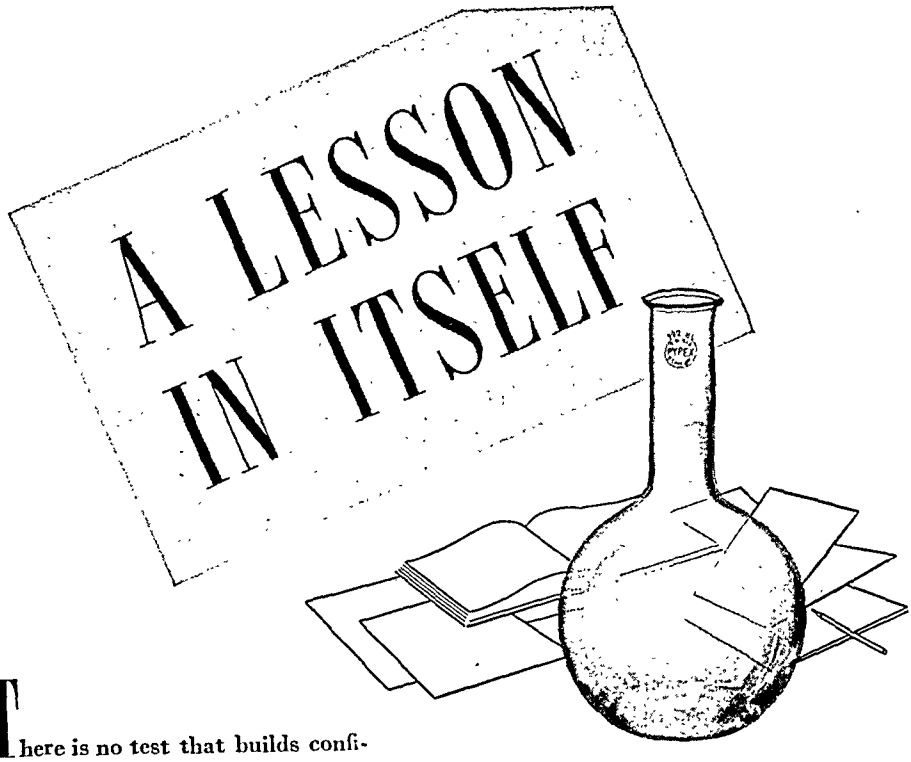
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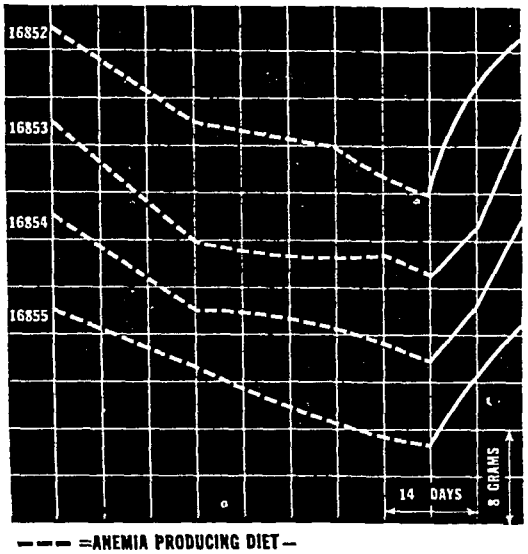
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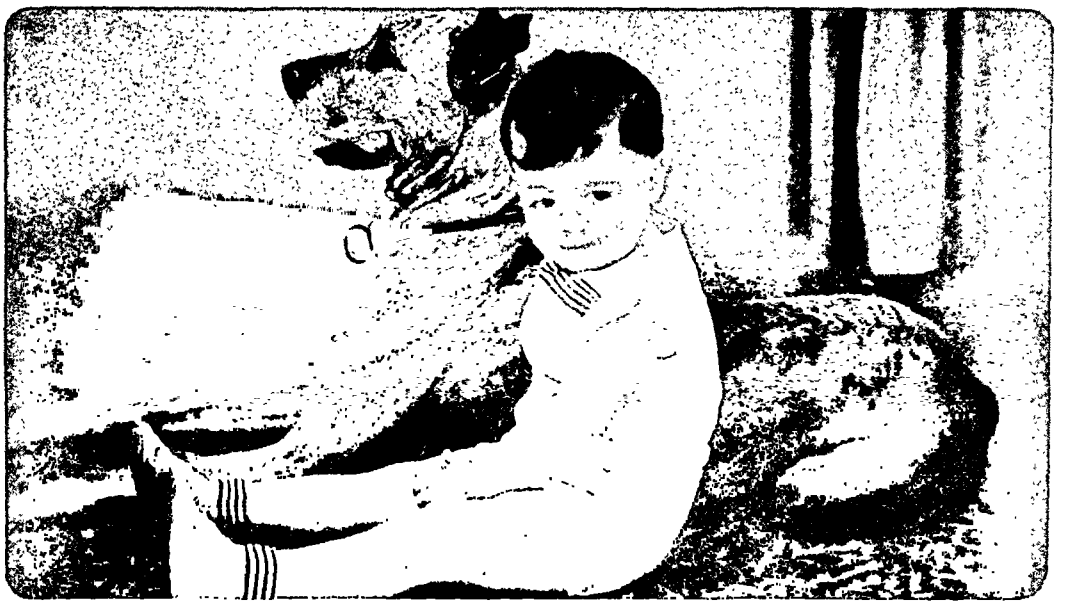
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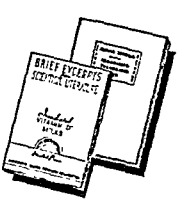
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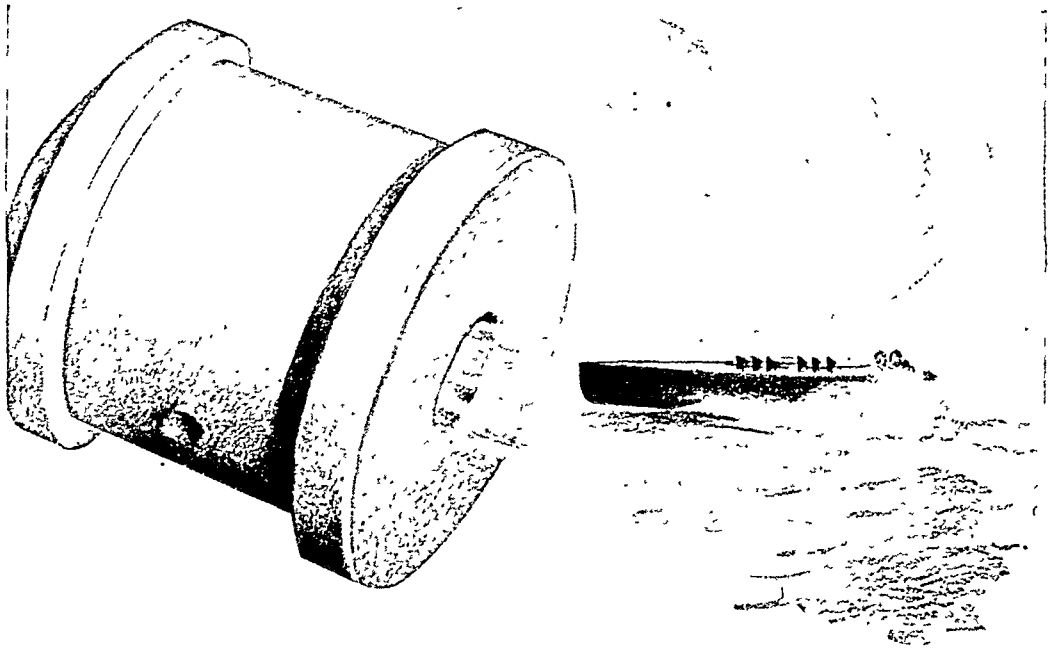
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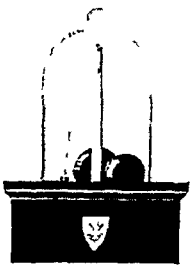
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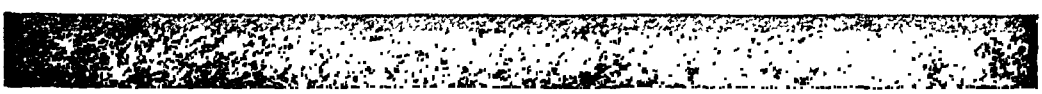
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American Journal of Public Health
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Volume 27 October, 1937 Number 10

The Early American Public Health Movement*

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Professor of History, Duke University, Durham, N. C.

THERE has been some tendency, in recent years, to refer to the early public health movement as having been largely "a matter of pipes" or a campaign against smells. The subject seems literally as well as figuratively a trifle malodorous; and there is an inclination to pass over it hurriedly in order to consider the superiority of the public hygiene of our own day. All this would have seemed startling to those early public health leaders who, nearly a century ago, felt that they had already undertaken the great health reform of modern times. There was, for example, Wilson Jewell of the Philadelphia Board of Health who, before anyone had heard of Pasteur and Koch, believed that the new health epoch had arrived. As early as 1851, he planned a national public health association, and in 1857 he led in the actual establishment of such an organization. "Happily for the cause of humanity and the science of public health," he then declared, this body "has inaugurated a new era in the domain of science." [1]

Now one may well raise the question: By what process does a program once viewed as "a new era in the domain of science" descend in our memories to a mere "matter of pipes" or a campaign against smells? By a simple process of forgetting, perhaps—a natural result of the continuous pressure of present interests and present obligations. Yet this is neither good history nor, presumably, is it good for our souls. It is neither fair to the pioneer sanitarians nor to ourselves; for there is always the danger that indifference to the past will promote complacency in the present. It is therefore the purpose here to recall briefly the chief characteristics of the early American public health movement. "Lest we forget . . ."

The story relates chiefly to the three or four decades preceding 1870, although it has a background reaching far into the preceding centuries. The early industrial revolution along the American seaboard, as in Western Europe, made the problems of public health more striking and more obvious

* To be read at a Special Session of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

than they had ever been before. The city concentrated disease and misery, as the poorest rural areas could never do. Wherever one turned in the growing manufacturing and mercantile towns, there was the same picture. The American of 1840 read with horror of Scottish tenements, where whole families crowded into single rooms, were provided with no running water, and paid their rent by selling their own dung heaps accumulated in the courts below.[2] Yet at home, in New York City, more than half the population lived in similarly overcrowded tenements, and some 25,000 people occupied the damp and dismal cellars of these same buildings. In Cherry Street, to be specific, a five story tenement occupying only two ordinary building lots, housed 120 families, which included more than 500 individuals.[3] I say merely "individuals" for under such circumstances one can hardly speak of them as "human beings." Similar conditions obtained in the slums of other American cities, and if it were desirable these could be described *ad nauseum*.

As might be expected, such circumstances made disease problems more acute as well as more obvious. The tragic history of the major endemic diseases, typhus, typhoid, and tuberculosis, is familiar enough. So far as can be judged from the imperfect bills of mortality, urban death rates rose ominously during the first half of the 19th century. New York City, which was most inundated by poor immigrants and which grew most rapidly, again affords a striking example. In 1810, the crude death rate had been reported as about 21 per 1,000; by 1857 it had risen to around 37—an increase of almost 80 per cent within 50 years.[4] Rates were lower in Philadelphia, but higher in New Orleans. What an increasing mortality implied in morbidity rates, to say nothing of "sub-clinical illness," is obvious enough.

Such conditions and such consequences cried to high heaven for reform. In both Europe and America, a few socially minded physicians had long demanded improvements, but for some time they were unheeded. The public was apathetic: and under the growing spell of a *laissez faire* philosophy, the upper classes were inclined to let the poor shift for themselves. The latter died by the thousands of unnecessary endemic diseases; and as long as their sufferings were not too obvious or did not threaten to spread to the better parts of towns, who cared?

What was evidently needed, in order to arouse the public conscience, was an epidemic which would dramatize disease and which would also threaten to spread it uptown.[5] Tuberculosis, which was becoming the great plague of the age, was of little service here, since it killed slowly, and the fear it aroused was in no way proportionate to its fatality. Smallpox was more promising, and likewise yellow fever; but the disease which best filled all the specifications was cholera. It struck at both town and country in the most mysterious, sudden, and fatal manner. The upper classes were not entirely spared, nor could they always escape observing the sudden collapse of the less fortunate. After this disease had passed, there was usually a demand for action.

A single illustration will suffice to show why this was so. When cholera visited Bishop Polk's Louisiana plantation in 1849, there were 350 negroes there—shall we say "in residence"? Within 2 weeks, 220 contracted the disease, and no less than 70 died on this one place.[6] The conditions obtaining during such a "visitation" can scarcely be imagined, but it is a safe assumption that the Bishop felt that something should be done about it.

What could be done was none too clear. The disease moved like a con-

tagion, but it struck hardest in slum areas or among the cabins of the poor. Those who maintained the 17th century emphasis upon contagion, demanded quarantine against cholera; but this signally failed to check its spread. On the other hand, the connection between the disease and bad living conditions was too obvious to be overlooked. Hence the experience with cholera weakened the hold of the contagion-quarantine doctrine and encouraged the revival of the classical thesis concerning airs, waters, and sanitary control. Those who feared cholera or other epidemic diseases, now combined with humanitarians to demand investigations and clean-ups on a scale never demanded before. In these circumstances is to be found the genesis of the modern public health movement.[7]

The first stage in this movement was one of extensive investigation. Individual physicians had already shown the way here; notably in the case of Villermés' studies of 1828, in which he had shown that disease was to a considerable extent a function of living conditions throughout France. Similar observations were made during the 40's by Arnot and Kay in London, by Griscom in New York City, and by Virchow in Silesia. Meanwhile, Chadwick carried out his famous national survey for the Poor Law Board in England.

Since there were no national or state medical offices in the United States, surveys here could be carried out only by towns or by private organizations. The National Institute in Washington called for a wide investigation, but could secure no help from governmental authorities. It then turned to the American Medical Association, when that body was formed in 1847, and persuaded it to report on the sanitary conditions of large American cities. In consequence of its findings, the American Medical Association recommended to state and local medical societies the two procedures which seemed indicated under the circumstances: (1) that the registration of vital statistics, hitherto restricted to large towns, be undertaken by all the states in order that a clear picture of disease trends could be obtained; and (2) that sanitary reform should be pushed at once in urban and even in rural areas.[8]

State medical societies thereupon began appealing to their respective legislatures for registration laws. The American Statistical Association, founded at Boston in 1839 in response to the development of that branch of mathematics, also supported this drive. Unfortunately, the extreme individualism and often the plain ignorance of democratic assemblies blocked such efforts in most American states—just at a time when progress was being made abroad. In Georgia, for instance, the legislature "fairly hooted" when a registration bill was introduced in 1849, and the whole matter was viewed as just another "trick of the doctors."[9] Yet Massachusetts did provide for state registration in 1843, and thus set an example which could thereafter be used in other states. Incidentally, as is well known, it thus provided for the longest mortality record of state population now available in this country.

The second part of the program urged by the American Medical Association; namely, actual sanitary reform, also made some progress during the decades before the Civil War. The early fear of yellow fever and of malaria had prompted some action in seaboard towns, even before the cholera emphasized this need. When yellow fever had devastated Philadelphia in the epidemics of 1793 and ensuing years, for example, the physicians who ascribed it to local filth persuaded the city to establish a permanent board of health. They also persuaded the town

to clean up its streets, and to build one of the first free public water systems in the country. It should be noted that while Dr. Benjamin Rush and the others who insisted on the local origins of disease were partially wrong, their mistaken theories nevertheless had value in promoting urban improvements. It is also interesting to observe that, perhaps as a result of these developments, Philadelphia maintained a relatively low death rate and became known as "First in the cause of sanitary reform." [10]

Other cities followed this lead, between 1800 and 1850, in establishing boards of health.[11] These boards were, to be sure, largely of an advisory nature and had no permanent health officers save for quarantine officials; but they provided the beginnings of a permanent organization which was expanded later when the need was finally recognized. For the time being, their most common functions were to advise during emergencies, and to inspect premises for nuisances. There was little state law on medical police save with relation to licensing and quarantines, but city ordinances were passed in the tradition of the English common law on nuisances.[12]

Occasionally these boards were able to secure substantial sanitary improvements, which in turn were apparently successful in decreasing morbidity and mortality rates. A notable example is afforded in the case of Savannah. Here the death rate from "autumnal fevers" —chiefly malaria—was reported, early in the century, at the amazing average of 70 per 1,000. Assuming the airs and waters etiology, which for obvious reasons proved quite effective in this case, the city eliminated all wet culture of rice in the vicinity in 1818. The autumnal mortality thereupon fell to an average of 26 for the next 6 years, and declined even more during the ensuing period.[13]

This, to be sure, was an exceptional case. Most American towns were still lagging in sanitary improvements during the 50's, and it is rather startling to recall that places as large as Providence and Milwaukee then had no public water systems.[14] Faced by such inertia, and absorbed in difficult technical and professional problems, the American Medical Association apparently lost its first enthusiasm for sanitary reform.[15] There seemed, in consequence, to be a need for some other organization to take up the leadership in health reform on a national scale. If the majority of physicians could not be interested in public hygiene, moreover, perhaps conscientious laymen could combine with socially minded doctors to set up a national health organization.

The answer to this need was found in the interesting national sanitary conventions that met from 1857 to 1860, and which began to function as the first association in America definitely devoted to the study of public health. Wilson Jewell, who was mentioned above, saw in the meeting of an international quarantine conference in Paris a suggestion for an analogous interstate meeting in this country. State quarantine regulations varied as much as did those of different nations, and merchants as well as medical men regretted the confusion involved. Jewell called the first meeting at Philadelphia in 1857, and municipal officials and doctors from the chief Atlantic and Gulf ports responded.[16] Subsequent sessions were held in Baltimore, New York City, and Boston.

Although the conventions had ostensibly met to consider quarantine regulations, it was immediately apparent that the members were more concerned with "internal hygiene" (sanitation) than with the "external" form (quarantine). The advocates of the latter

procedure were on the defensive from the start. Contagion was never entirely denied, notably in the case of smallpox, but the majority felt that the medieval doctrine had been greatly overdone—to the serious discomfort of both passenger and mercantile interests. Dr. Arnold, the mayor of Savannah and a delegate to the fourth convention, ridiculed the few contagionists, by recalling an occasion when his "excellent old aunt had been quarantined at New York because she had the gout." He concluded by thanking God that the conventions had "swept away one of the last relics of barbarism—the infernal restrictions of quarantine." [17]

The last stand of the contagionists was attempted during the discussions over yellow fever. Since physicians lacked as yet most laboratory technics, the empirical evidence on the causes and carriage of this disease was most confusing. Dramatic indeed were the yellow fever debates at the New York meeting, which subsequently filled more than 100 pages of the proceedings. Dr. Francis of New York, a gentleman of the old school, held to the early view that he had inherited from Dr. Hosack at the beginning of the century; namely, that "a contagious principle lurks in the fever now under discussion," [18] but the younger men overwhelmed him with evidence that it was never transmitted by contact—it was never a "man to man" affair. We can now see that both interpretations were right, and both wrong—a possibility that never seems to have occurred to either side in the controversy.

Having silenced the contagionists, the sanitarians next laid down their own program. This was somewhat broader than is now usually recalled, as it included not only model laws providing for state and local health boards, sanitary regulations, and modified quarantine laws, but also provided for experimental studies of sewage, ventilation, and disinfectants, and for the passage of pure food and drug laws. In a word, the delegates were concerned with research as well as with improved administration, and were as anxious to encourage the one as the other.

Last but not least, the members of the conventions were alive to the need of educating the public, although this is now often viewed as a "recent" function of health administration. To this end, they encouraged the formation of "sanitary associations" in large cities, similar to the "health of towns" societies in Great Britain. An apparently flourishing association of this sort, set up in New York City before 1860, was active in the drive which finally led to the reform of health administration in the metropolis.

In this connection, also, it should be recalled that the sanitarians were teaching the public a naturalistic as opposed to a theological or superstitious etiology. The concept of filth as a cause of disease was a bit vague, but it was actually more tangible than even the bacteria about which the public is now so generally informed. No wonder that sanitarians scoffed at superstitious fears, and that for prophylaxis they recommended clean-ups rather than fasts.

The efforts of the convention leaders to establish their association permanently seem rather pathetic, in view of the aftermath. Jewell wrote, in 1859, that he viewed the conventions as a permanent institution "destined to revolutionize the public mind and will." The Boston meeting of June 1, 1860, heard a discussion of plans for permanent organization, and appointed a committee to submit such plans at Cincinnati in 1861.[19] Enthusiasm was growing, and all looked forward to rapid progress in the immediate future.

It was true that sectional tension along the Mason and Dixon line was increasing, but medical leaders ignored the political hubbub in Baltimore and points South. Arnold, of Savannah, presided at the last sessions, and when he concluded with gracious praise of Boston hospitality, his New England hearers gave three cheers for Georgia! [20] That was about the last time that Arnold saw any Northerners, until he surrendered his city to Sherman's army one December day 4 years later. Such contrasts almost make one wish that the country had been governed by the doctors rather than by the politicians.

The outbreak of the Civil War in April, 1861, preceded the proposed Cincinnati meeting, and so the first national association came to an untimely end. Space does not permit a discussion of the diversion of public health endeavors into military channels; although this story is in itself an interesting one. Broadly construed, it includes such phases as the expansion of the Federal and the Confederate Medical Corps, the establishment by Dorothea Dix of the first trained nursing service in the United States base hospitals,[27] and, most important, the development of the U. S. Sanitary Commission.[22] That the war presented problems of public health on a peculiar scale will be obvious, when it is recalled that during the first year, five-sixths of the deaths in the Union armies were due to illness having no connection with the battlefields.[23]

The war also wrote other chapters in the history of disease and public hygiene which can be only mentioned here. There was the destruction of Southern economy and the consequent surging of ignorant rural negroes into towns, where they gave up the crude health insurance provided by the slave system and in exchange received freedom and complete neglect. Thereafter, they indulged unhindered in life, liberty, and the pursuit of the venereal diseases. Negro mortality rates rose rapidly above the white, after 1864 [21]; and it is hardly exaggeration to say that only within the most recent years have some of the resultant problems been seriously attacked by the American Government.

Incidentally, the war did some good —in spite of itself, one is tempted to say. Army medicine is state medicine by definition, and numbers of promising young men like John S. Billings and S. W. Abbott attained their early interest in public hygiene as a result of army experience. Older leaders also carried on in the same field; and after the war, picked up their sanitary reform program where they had dropped it in 1860. This was easier to do in the victorious North than it was in the devastated South. In 1869, Massachusetts finally provided for the State Board of Health which Shattuck had so well planned some 20 years before. And within 3 more years, a renewed call for a national body resulted in the formation of the present American Public Health Association. The somewhat jerky continuity of this story is illustrated by the fact that Dr. Elisha Harris of New York was one of the leaders in the early Sanitary Conventions, then served as an important member of the U. S. Sanitary Commission, and finally became the Secretary of the new American Public Health Association in 1872.

Another illustration will be found in the case of Dr. Arnold, the presiding officer of the Boston convention already mentioned. During the war, he was in charge of a Confederate base hospital at Savannah; and then, in 1872, he accepted enthusiastically the invitation to join the revived public health association. As Arnold had also served as the first secretary of the American Medical Association, it is interesting to find him declaring—in

these later years—that he had long considered that organization a failure. He now pinned his hopes rather on the American Public Health Association.[25]

It is doubtful if many of those who organized this Association in 1872 could have had any realization of the great changes in public hygiene which lay just ahead of them. To their minds, they were picking up an old but promising movement for sanitary reform.[26] Now, however, as we look back upon them, the founders of the Association seem to have been inaugurating the new era that was ushered in by the bacteriological revolution.

That this revolution profoundly changed the nature of public hygiene is obvious to all. How effectively this was done is well recorded in the essays published by this Association in 1921.[27] Public hygiene entered a new and far more promising era in 1872. But for this very reason, the present generation can afford to be generous in recalling the labors and achievements of those ante bellum leaders who now appear to us as pioneers.

FOOTNOTES

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13. Gamble, Thomas, Jr. *History of the Municipal Government of Savannah, 1790–1901*, pp. 143 ff. (Included in The Mayor's *Ann. Rep.*, Sav., 1900.)

14. Cole, A. C. *The Irrepressible Conflict*, New York, 1933, p. 181.

15. On the early relation of the A.M.A. to public health reform, see *Proc., Third Nat. Quar. & Sanitary Convention*, p. 213; H. I. Bowditch's statement to the Intern. Med. Cong., Phila., 1876 (*Public Hygiene in America*, Boston, 1877, p. 37); Stephen Smith's "Remarks," *Papers and Reports*, A.P.H.A., XXII:21, 1897.

16. *Minutes, Nat. Quar. & Sanitary Convention* (Philadelphia, 1857), pp. 3–11; *Proc., Third Nat. Quar. & Sanitary Convention* (New York, 1859), pp. 3–6.

17. *Proc., Fourth Nat. Quar. & Sanitary Convention* (Boston, 1860), p. 127.

18. *Proc., Third Nat. Quar. & Sanitary Convention*, pp. 150 ff.

19. *Proc., Fourth Nat. Quar. & Sanitary Convention*, pp. 8, 13, 155. I am indebted to Dean Stanhope Bayne-Jones, of Yale University, for the proper emphasis upon the influences making for a naturalistic view of disease causation. In the paragraph above, however, I have projected his interpretation of the work of bacteriologists into the earlier efforts of the sanitarians as well.

20. *Ibid.*, p. 107.

21. Marshall, Helen E. *Dorothea Lynde Dix* (Chapel Hill, N. C., 1937), pp. 201 ff.

22. Stillé, C. J. *History of the U. S. Sanitary Commission* (Philadelphia, 1866), chaps. 1–3.

23. *U. S. Sanitary Comm. Doc.*, No. 46 (New York, 1862), pp. 5 ff.

24. See, *e.g.*, Duncan, W., *Tabulated Mortality Record of the City of Savannah* (Savannah, 1870), p. 36.

25. Arnold to Dr. Elisha Harris, Savannah, April 26, 1873, in R. H. Shryock (ed.), Selections from the Letters of R. D. Arnold, *Bull., Johns Hopkins Hosp.*, XLII:238, 1928.

26. Note the nature of the papers and reports submitted to the Association between 1873 and 1876, as summarized in Stephen Smith's Historical Sketch of the A.P.H.A., *Reports and Papers*, A.P.H.A., V (Boston, 1880), XI ff.

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An Improved Medium for the Demonstration of Hydrolysis of Sodium Hippurate by Streptococci *

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THE majority of hemolytic streptococci of bovine origin differ from those commonly encountered in human disease in that they hydrolyze sodium hippurate.[1] Thus, when facilities are not available for serological classification,[2] tests for hydrolysis may yield data of practical significance in the examination of strains from milk which appears to have a causal relation to outbreaks of streptococcus infection. The value of the test, however, obviously rests upon the uniformity of the reaction in different lots of the test medium. Failure to secure such results under what were demonstrated to be uniform methods of preparation and of technic led to a reëxamination of the formula.

In the course of a study to evaluate procedures for the isolation and identification of hemolytic streptococci,[3, 4] the hydrolytic activity of several hundred strains had been determined according to the method of Ayers and Rupp [1] by the addition of ferric chloride to the cultures grown in 1 per cent sodium hippurate broth of the following composition:

Peptone, Parke-Davis Bacteriologic	1 per cent
Pepsin (U.S.P.), Eimer & Amend	0.5 per cent
Calcium chloride (C.P.), anhydrous	0.003 per cent
Ferric chloride (C.P.), Baker—1 per cent solution	1 drop per 1,000 c.c.
Sodium hippurate (C.P.), Eimer & Amend	1 per cent

When no evidence of hydrolysis was obtained in recent lots similarly prepared, comparative tests were made with an old, satisfactory medium, and a new, unsatisfactory one which differed in the lot of peptone used. Growth in the two media was similar and it was demonstrated that the cultures had retained their ability to hydrolyze sodium hippurate. Furthermore, the presence of catalytic agents which enhance or inhibit the reaction was not demonstrable with either of the media. Since the composition of peptone has been observed to affect other biological activities of microörganisms,[5-10] different lots and brands of peptone were compared and, at the same time, a substitute of more constant chemical composition was sought.

The experimental batches of media were prepared according to the fore-

* Presented before the Eastern New York Branch of the Society of American Bacteriologists, Albany, N. Y., April 3, 1937.

going formula with 6 different lots and 2 brands of peptone.

In testing these media the usual procedure was followed: cultures were grown in each medium for 48 hours; to 1 c.c. of culture there was then added 0.25 c.c. of 12 per cent ferric chloride solution prepared by dissolving the salt in distilled water containing 2 c.c. of concentrated hydrochloric acid per liter. As a control, cultures of each strain grown in the same basic medium without sodium hippurate were similarly tested. Hydrolysis was indicated by the formation of a heavy precipitate of ferric benzoate when ferric chloride was added to the test culture. A precipitate should not appear in the control tubes.

Little or no evidence of hydrolysis was obtained with cultures known to hydrolyze hippurate. The addition of larger amounts of calcium chloride—from 0.003 per cent to 0.015 per cent—to one of the unsatisfactory media failed to modify the reaction.[11] However, by replacing calcium chloride with 0.15 per cent dibasic potassium phosphate, which had been used by Ayers and Rupp,[1] peptone media were prepared in which characteristic reactions occurred. This substitution was not effective with all peptones and, moreover, it introduced a source of error, since phosphates are precipitated by ferric chloride.

The peptone was then replaced by asparagine.[12] Hydrolysis of sodium hippurate occurred in the asparagine medium when either dibasic potassium phosphate or calcium chloride was present. No differences were observed between the results obtained with media containing 0.3 or 0.1 per cent asparagine. The following medium adjusted with N/1 sodium hydroxide to pH 7.1 has therefore been adopted in the cultivation of streptococcus cultures for tests of the hydrolysis of sodium hippurate:

Asparagine (C.P.), Eimer & Amend	0.1 per cent
*Pepsin (U.S.P.), Eimer & Amend	0.5 per cent
Calcium chloride (C.P), anhydrous	0.003 per cent
Sodium hippurate (C.P.), Eimer & Amend	1 per cent
Distilled water	1,000 c.c.

* In the medium prepared without pepsin, no hydrolysis was demonstrable.

The experience reported in this paper emphasizes the necessity of a preliminary test with cultures of known biochemical properties for any medium which is to be used in differential studies. The control cultures in tests for hydrolysis of sodium hippurate should include hydrolytic and non-hydrolytic strains grown under conditions comparable to those used for the test cultures. Since the presence in the medium of substances such as phosphate may cause the formation of a precipitate when ferric chloride is added, cultures of each strain grown in the same basic medium without sodium hippurate should be available for comparison.

SUMMARY

A medium is described which yields uniform results in tests for hydrolysis of sodium hippurate by hemolytic streptococci. It substitutes 0.1 per cent asparagine for 1 per cent peptone in pepsin broth.

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Raw and Pasteurised Milk in Calf-rearing

AT the request of an Expert Sub-Committee of the Milk Nutrition Committee an experiment was carried out to determine if any differences could be detected between raw and pasteurised milk by the use of these milks in the feeding of calves.

The experiment was begun in October, 1935, and finished in July, 1936. Thirty-two Shorthorn bull calves from tubercle-free herds were obtained between October and January when 4 to 5 days old, grouped in pairs of similar age and weight, and one of each pair, chosen by lot, received raw milk and the other pasteurised milk. . . .

The number of pairs which completed the experiment was 11; the other 5 pairs were broken up by the death or removal for an adequate reason of one of each pair. . . .

Records were kept of the food consumed, the live weight gains, appearance of the calves, and other relevant matters. No material differences were shown between the calves receiving the two types of milk. This similarity in results is illustrated by the average daily live weight gains—the 11 calves receiving raw milk increased during the period of 6 months at the rate of 1.967 lb. per head, and those receiving pasteurised milk at the rate of 1.969 lb. per head. A full report is in the course of preparation.—National Institute for Research in Dairying, University of Reading (England), *Annual Report of Year ending September 30, 1936.*

Maternity Care in Rural Areas By Public Health Nurses*

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MATERNITY care in rural areas by public health nurses is a family service. It is assumed that the relationship to all other types of home visits is known but perhaps more than in any other classification is it truly a family visit, for every member is the concern of the mother and only in so far as the nurse is able to help the mother solve her family problems will she be successful in her maternity work.

There is always need for maternity care in any community, but in many rural areas there is no other agent than the public health nurse to teach parents the what and how and why of care. Many rural families have no newspapers, magazines, or radios to bring them health messages. If they see a physician, it is only in some emergency unrelated to child bearing.

The ignorance of rural families as to the value of maternity care, particularly antenatal care, is appalling. One nurse in New York State was called to assist a physician at the confinement of a farm woman giving birth to twins. She had had no antenatal care by physician or nurse. She lived 18 miles from the nearest physician and her only means of transportation was a farm wagon. Is it any wonder that she had not visited him? After she had been in labor for 2 hours, her husband sent her out to milk 7 cows. The twins were born 3 hours later. This was her 6th pregnancy and for only the first had she had a physician at her confinement. There was no household help and only through the insistence of the nurse would the husband consent to hire someone, so that his wife could remain in bed for 10 days. After the birth of her other children, she had resumed her full household duties in 2 days.

In addition to the ignorance of this need, many other factors contribute to the meager care which the rural woman receives. She is inclined to sacrifice care of herself to the needs of her family. A visit to a physician costs money which she is loath to spend when she can see no need. The distance to the doctor's office is great and the road conditions are poor, particularly in winter and spring. If the family owns a car, the woman usually does not drive and the husband cannot leave the farm to transport her. Her confinement is usually in the home and she makes little or no preparation. Facilities for an aseptic delivery are inadequate. Skilled nursing service for delivery and postnatal care is not available. If she were financially able to go to a hos-

* To be read at a Joint Session of the Public Health Nurses and the Child Hygiene Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

pital, she would be afraid to venture there. The hospital facilities in rural areas are limited and inaccessible.

The combating of these conditions is part of the service which the public health nurse, working in rural areas, must meet. Her first step is education, not only of the parents needing her assistance but of the community as well. Better care for mothers in childbirth is a community responsibility, and the effectiveness of the nurse's efforts is directly related to the facilities for care and the interest of the community at large.

It is not necessary to elaborate on the detail of the antenatal nursing visit, which is the same wherever the service is rendered. The lack of clinics and social agencies to which the nurse may turn for help in the country, however, presents serious handicaps in solving social problems. The town welfare officer is usually the only agent providing medical and material relief. He is overburdened with problems and hesitates to spend money for a seemingly well expectant mother to visit her physician or to provide additional foods in her diet.

At no time during her pregnancy does a woman want or need nursing service more than at her confinement. Unfortunately, this is the most difficult service for nursing agencies to provide. The administrative problems which are inherent in a delivery service are more perplexing in a rural area than in a city. In common with all such services there is the excessive cost, the necessity for a large nursing staff to be prepared to answer calls at all hours, the time element and the interruption of the educational service. In rural areas there are in addition other problems which are difficult to meet. Chief among these are

The distances which the nurse has to travel. It is oftentimes dangerous, particularly in the winter, when the roads are drifted and icy, and in the spring, when the mud makes them almost impassible. There is also the hazard of night driving. All travel is time consuming.

The difficulty of distributing the service evenly to cover all areas and serve all physicians. It is usually the physicians in and near the nurse's headquarters who call for the service most frequently.

The problem for arranging for day and night telephone service. There are no established directories and the toll charges are costly.

It is practically impossible to reach the nurse in the field during the day after she has left her office in the morning. Even though a place for receiving calls could be provided and her itinerary left there, few of the homes which she visits have telephones.

The service is even more time consuming than in the cities because, if a nurse finds that her patient is not in active labor and it is not necessary for her to remain in the home constantly, she might visit another home in the city, whereas in the country the distance is too great, so she has to remain through long hours of waiting.

Nursing assistance at confinement is probably appreciated by the physician more than any other phase of the nurse's maternity work. It is a most valuable aid in selling the antenatal nursing supervision service, both to physicians and the community.

Even though the delivery service is not definitely a part of the planned program for rural maternity nursing, every public health nurse should demonstrate the need for such a service by assisting at a few deliveries. This can be planned with the physician for those patients needing care most. If she is unable to be present at the confinement of her patient, it is her responsibility during the antenatal period to instruct some helper in the details of assisting the physician. A definite appointment should be made for this home visit in the early part of the 8th month. Every step should be carefully demonstrated. This presents a problem in the country because the

nurses find that the families are reluctant to decide until the last minute who will be asked to render this service which is usually unremunerative, or, after the nurse thoroughly instructs one person, the patient changes her mind and calls on someone else.

The public health nurse is responsible for the postnatal nursing care of all maternity patients registered with her. This may be actual daily care or the supervision of a helper in the home. The nurse should make plans during the antenatal period to be notified immediately of the birth of the baby, she should visit the home the same or the following day, unless a private duty nurse has been employed. She should know that the mother is receiving adequate, intelligent care. Her subsequent visits will be planned according to the need.

St. Lawrence County, N. Y., was selected for a demonstration of maternity care by public health nurses with the aid of Social Security funds because of a comparatively high birth rate, the persistently high infant mortality rate, the predominantly rural population, the large number of home deliveries and the interest and coöperation of the medical profession.

The nursing service is generalized with special emphasis on maternity nursing, including assistance at home confinements. The two methods of organizing a delivery service—one on a specialized basis, with 2 or 3 nurses assigned to answer all delivery calls or—the other on a generalized basis with each nurse responding to calls in her own district—were given careful consideration. It would be impossible to assign in strategic areas throughout a county the size of St. Lawrence even 3 nurses to serve all physicians requesting the service. For this reason, it was necessary to generalize the entire service and plan for all nurses to answer delivery calls in so far as it was possible.

The objectives in the demonstration are to learn the cost of the service; if such a service is possible and feasible for rural counties; and what methods may best be used in developing such a service.

St. Lawrence County covers an area of 2,701 square miles and, according to the 1930 census, has a population of 90,960, of which 57.6 per cent is rural. The urban population is located in 1 small city and 4 villages. There are 3 hospitals in the county, exclusive of the State Hospital for Mental Diseases and a private tuberculosis hospital, and 8 unincorporated maternity homes.

There were 1,724 resident births in the county in 1935, including 63 stillbirths; 1,030 or 60 per cent of these occurred in the rural areas, and 76 per cent were in private dwellings.

The demonstration started in January, 1937. At that time, there were 19 nurses in the county, 2 state aid to county nurses, 1 city nurse, 3 village nurses—one of whom spends half time in the schools and another whose service includes social investigation for the welfare officer—7 WPA nurses, and 6 state nurses. Some changes have been made in the nursing staff in the first 6 months of the demonstration due to resignations, illnesses, and the discontinuing of 1 WPA nursing service. On July 1, there were still 19 public health nurses working in the county, with 8 state nurses instead of 6.

The state nurses were placed in 6 centers. In selecting these centers consideration was given to the needs of the community, the other public health nurses in the area, the roads and their conditions, the location of the physicians serving the area, and the available office space with telephone service. This last factor was important because in rural areas such space is at a premium. Also to assign nurses to centers covering areas that were served

by physicians covering the same area was difficult in distributing the service evenly throughout the county. If a physician outside of a nurse's headquarters calls her at night it means that she must travel alone over lonely and dangerous roads. The physician usually takes the nurse in his car on night calls if she lives in the same village.

Nursing assistance at delivery was offered to the medical profession in local groups by the District State Health Officer, and to the individual physicians by the nurses in office interviews.

The responsibility for calling a nurse was placed on the physician since there was no central agency as a nurses' directory or visiting nurse organization, as in a city. The nurse's office and home telephone numbers were given to the individual physicians in the area which she served. This presented problems also because in some instances physicians outside of the nurse's territory would be engaged for patients whom she had under care. This would mean a long distance call for the physician.

To supply the service at all times for all areas proved impossible. It meant that if there was only 1 nurse in a center she would never be free to leave her headquarters even over the week-ends. With 2 nurses in a center it seemed impossible as well because if one nurse remained on call and went out to a delivery, there would be no one to answer a second call less than 20 or 30 miles away. Therefore, it was decided that if the nurse knew that a patient was actually in labor she should remain on call; in most instances, it has resulted in the nurses remaining within call when off duty if they even expect a patient to start in labor.

The question of how to relieve a nurse for overtime has not been answered and the accumulation of such overtime has already reached serious proportions.

To establish routine technic for nursing care at delivery, outlines were prepared, printed on cards which the nurse could carry in her bag.

A special effort was made by the nurses to find expectant mothers early in pregnancy in order to get them under medical care, if they had not already registered with their physician, and to offer nursing supervision. This was done largely by inquiry from anyone encountered in the daily routine of service. One nurse tells of stopping in a store in a small village to ask directions to the home of her next patient. In the course of conversation, she asked the proprietress if she knew of any pregnant women in the neighborhood. The proprietress replied that she herself was pregnant, that the woman across the street was also expecting a baby, and another woman up the road, and so on, giving the nurse several names at once. This nurse found 24 expectant mothers that month. When the demonstration started on January 1, there were 60 antenatal cases under the nurses' care. In the first 6 months, 272 have received nursing supervision with 137 remaining under care on July 1.

It is interesting to note the sources through which these women were referred to the nurses: 116 or 47 per cent, came under care through the physicians; 45, or 18 per cent, the nurses found; and 41, or 16 per cent, reported their condition to the nurse. Other sources averaging 5 per cent or less of the total were neighbors, family, welfare officers and other patients. One delivery call was received through the State Police.

The month of pregnancy at which these women came under nursing care shows conclusively the need for early case finding. Twenty-seven, or 10 per cent, were found before the 5th month of pregnancy; 83, or 33 per cent, from the 5th through the 7th month; 51,

or 20 per cent, in the 8th month; and 74, or 30 per cent, in the 9th month. Twelve women, or 4.8 per cent, received no antenatal nursing supervision. The calls came from the physician for assistance at delivery.

The figures for the patients under supervision for the first 6 months of the demonstration bear out the statement made previously of the large number of home deliveries in the county. Two hundred fifteen, or 77.7 per cent of these women, were confined at home; 55, or 19.8 per cent, in hospitals; and 6, or 2 per cent, in maternity homes. The nurses participating in the demonstration assisted at 124, or 43 per cent, of these home deliveries; and 7, or 2 per cent, employed private duty nurses. Eighty-four, or 30 per cent, had family care.

The time spent on labor and delivery calls has averaged 6 hours per case with 50 minutes travel time.

The problems encountered in the homes and the complications of diseases of the patients are many. In February, one nurse working in 2 entirely rural towns in the mountains reported 7 births in the area, 6 in the homes, and 1 in a hospital. The nurse assisted at all of the 6 home deliveries, only 1 of which was normal. The first patient had a cardiac condition and was unable to nurse the new baby. She also had an 11 months old child still being fed from the bottle. The second patient was a diabetic receiving insulin. The 3rd had a gonorrheal infection with condyloma and had an episiotomy with repairs. The 4th patient had severe labor pains for 2 hours daily for over a week. The 5th was normal. The 6th was a poor unfortunate whose husband was in jail. Her young brother walked a mile to phone for the doctor who at the time was setting a broken arm, so could not leave immediately. The brother called the nurse who arrived 7 minutes before the baby was born. The patient was in labor only 1½ hours. The nurse delivered the baby and had both patients cared for by the time the brother had returned after walking 2½ miles to ask a neighbor's help.

SUMMARY

This is only a preliminary report and it is early to draw conclusions from this demonstration but some of the difficulties encountered in the first 6 months may be enumerated:

The nurses state that they are unable to visit their other patients as frequently as is necessary with a heavy maternity case load.

There are insufficient nurses to give adequate antenatal nursing supervision to the number of patients registered with the service.

There is difficulty in deciding how the maternity cases should be selected in order to give adequate service.

In the rural communities, there are no organizations able to purchase material for the making of maternity packages for border-line cases.

It is difficult, with the limited number of nurses, to keep one on call for delivery service at all times for all areas.

It is difficult to provide relief during the day for the nurses who have been out on deliveries at night. This necessitates their caring for their bedside service, which is chiefly postnatal care, before they get their needed hours of sleep. It generally means that the nurse travels some distance to reach this bedside case and so she does whatever else is scheduled for that area before she returns to her headquarters. Consequently, her hours of work are long.

These are a few of the problems that have been found and are still unsolved. In meeting the complexities of starting the work, the development of community resources has received little attention thus far.

CONCLUSION

In conclusion, I would like to report the enthusiasm of the nurses for this maternity service. Those who were not much interested at first now look forward to a delivery call, even in the middle of the night. One nurse

planned her vacation so that all patients scheduled for delivery service in her district would be confined before she left. Another returned to duty after a major operation 2 weeks before her supervisor thought that she should. All are monthly increasing their maternity case load. The almost too rapid expansion of the entire maternity program is an evidence of the interest of the physicians, the people, and of the nurses themselves. Such coöperation and enthusiasm seem to indicate the ultimate success of the demonstration.

Health Congress at Birmingham

I HOPE I have not appeared to you—in reckoning these achievements of our own time—to be complacent. A Minister of Health is the last member of the Government who should ever be complacent; in all the services I have mentioned there are advances to be made, deficiencies to make up, gaps to fill. Water supplies and sewerage are satisfactory in the great majority of urban areas, but there is still much room for improvement in the villages, though I think you will agree that the recent Exchequer grant of one million pounds has made possible great advances in rural water supply. It is true that infectious disease is under firm control, but no less than three outbreaks in 1936, including the Bournemouth typhoid epidemic, with its heavy death roll were directly traced to the consumption of raw milk and their extension checked when pasteurisation was adopted. Tuberculosis, it is true, is no longer the captain of the men of death, but it still takes a heavy toll, especially between the ages of 15 and 25.

So far as maternity and child welfare is concerned, we are saving the babies, but we should like to save more of the mothers. Fortunately, the maternity death rate last year was the lowest since 1922, and the new scheme assuring a properly trained midwife for every confinement, together with the improvements in the service which should follow the report of the expert investigation published this spring, should make it lower still; I should like to express my indebtedness and that of the whole country to Sir Comyns Berkeley for the help he gave in that particular direction.—The Right Hon. Sir Kingsley Wood, Minister of Health. *J. Roy. San. Inst.*, Aug., 1937.

The Homicide Situation in the United States*

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IT may be considered rather unusual that a member of the Vital Statistics Section has seen fit to go astray from the regular fields of birth and death statistics, and attach himself to a subject which might be best discussed in an assembly of law-enforcement officials; yet, if I were to confine myself almost entirely to statistical tables, charts, curves, and intricate mathematical formulae, I might still be considered orthodox and not straying from the fold.

I am going to quote some figures, and they do not come from the pages of a weekly or monthly lay magazine, but from the U. S. Bureau of the Census, the Federal Bureau of Investigation, the Canadian Bureau of Statistics, the Registrar General of England and Wales, and from the Mississippi State Department of Vital Statistics—all of which sources are perfectly reliable.

I have long believed that we, as state registrars, should not confine our efforts entirely to perfunctory publication of dry statistics on births, deaths, marriage and divorce, but should keep our eyes open to the leading truths portrayed by our data, commending the good and condemning the evils and their consequences. In so doing, we vitalize our vital statistics, we properly serve our people, and popularize our departments.

There is also a particular reason why we should lead the way in the portrayal of conditions ordinarily not considered within the province of health officials and vital statisticians. We must remember that we live in an age which holds very few of the customs and habits of the day when health departments were first organized. At the time these statutes were enacted, no one dreamed that a day would come when the United States would suffer huge mortalities from preventable causes other than disease. We have more deaths now from accidents than we have from all the contagious and infectious diseases combined, excepting tuberculosis. Instead of being called the "State Health Department," it would be more fitting to give the name "State Life Saving Department." How much more dead is a boy or girl who has succumbed to typhoid fever or diphtheria, than is another boy or girl who has been knocked to Kingdom Come by an automobile? Therefore, I am convinced that state and city directors of vital statistics and statisticians in general should become deeply concerned with the figures that bear on preventable causes of death other than contagious and infectious diseases.

Homicide is a preventable cause of death. There were more homicides in the United States during 1935 than the grand total of deaths from typhoid

* To be read before the Vital Statistics Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

fever, paratyphoid fever, typhus fever, undulant fever, smallpox, scarlet fever, and diphtheria.

STATISTICAL

1. *Numbers and Rates*—Very few states can furnish any definite statistical data on crime. Some time ago I mailed a simple questionnaire to the Attorney General in each of the 48 states, as follows:

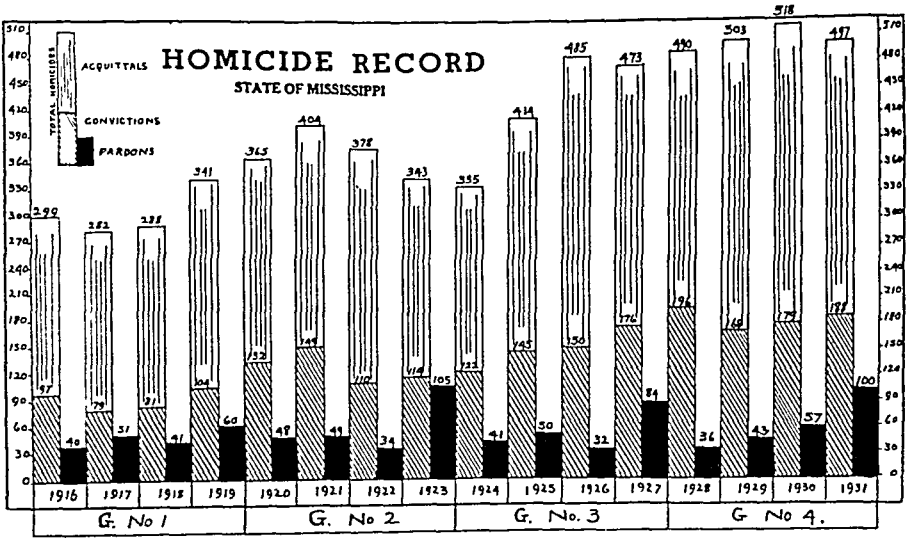
1. Does your state provide for capital punishment, and in what form?
2. What percentage of murder cases terminate in conviction?
3. What percentage of murder convictions are appealed?
4. What is the average length of time between the act of murder and carrying out the sentence?
5. What is the average time served on a life sentence in your state exclusive of deaths in prison?
6. What percentage of persons convicted of murder and manslaughter in your state are pardoned?
What percentage are paroled?
7. Do you believe that under present conditions murder and manslaughter in the United States would be greatly reduced if the Jury System were abolished and 5 regular judges were substituted for each jury?
8. To what extent do you believe alcohol is responsible for murder and manslaughter in the United States?
9. Will you please offer any suggestion you may think advisable for improving the homicide situation.

Replies were received from 28 states, but the attorney general of no state could give in full the statistics desired. Only 3 or 4 of them could answer more than half of the questions asked. In other words, I failed to get a crime picture in the United States to present to this assemblage, but I was able to learn that there is no such picture where one should really exist. Such statistics are of vast importance to the welfare of the citizens of every state.

The Federal Bureau of Investigation has been very active in accumulating statistics on crime throughout the United States. Its information is obtained principally from towns and cities, but deals only with arrests made and not with acquittals, convictions, sentences, paroles, and pardons.

My department of Vital Statistics is the only source of information in Mississippi which shows the number of homicides and the number of legal executions. This is true in most of the states.

From a study of the records of the U. S. Bureau of the Census I am



glad to find a steady decrease in homicides and in the homicide rate in the United States during the past 4 years. In 1933, homicidal deaths totaled 12,124 with a rate of 9.6 per 100,000 population. During 1936 provisional reports from all but 2 states indicate a decline in 4 years of approximately 2,000 in deaths and 1.7 in the rate. I cannot help believing that the Federal Bureau of Investigation, with J. Edgar Hoover at its head, is responsible for this favorable decline.

The state rates for 1936 vary all the way from 0 in Vermont to 25.5 in Mississippi. This is the first time in several years of observation that I have found a state without a homicide. Twenty-three states each had a smaller homicide rate than 5 per 100,000; 10 others produced rates between 5 and 10; while 15 states and the District of Columbia developed rates above 10 per 100,000. These 15 states comprise 13 southern states, with Arizona and Nevada in the West.

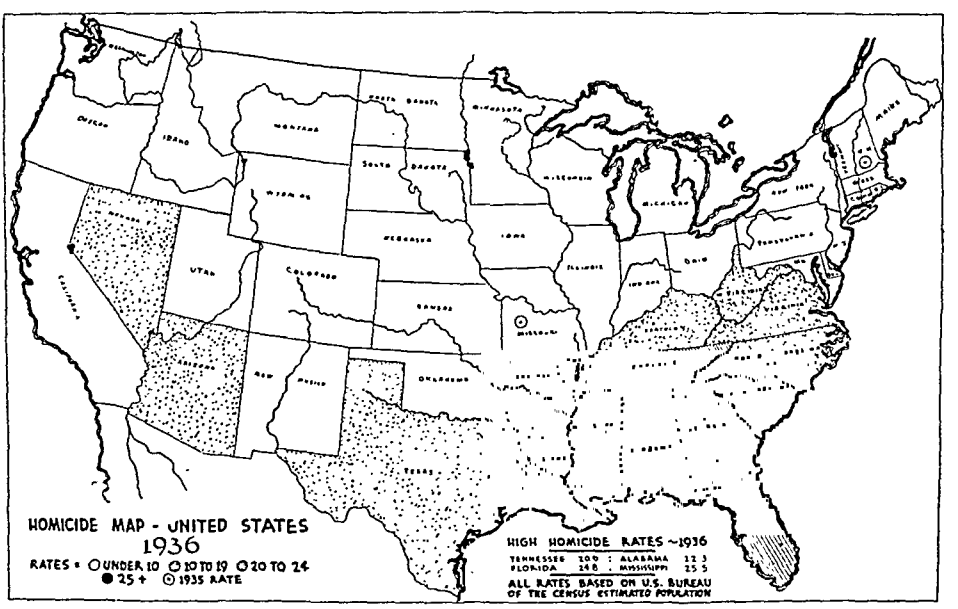
The heavy homicide rates in the South are due to the colored race. Mississippi has the highest homicide rate. It also has the highest percentage of colored population in the United States. Mortality statistics published by the U. S. Bureau of the Census for the year 1930, when populations were not estimated, show the following homicide rates: Registration Area, 9.0; white, 5.6; and colored, 36.3. Thirteen southern states that year produced homicide rates varying for whites from 5.1 to 12.3; and for colored, from 18.5 to 63.7.

HOMICIDE RATES—1930 *

Registration Area	9.0
White	5.6
Colored	36.3

	White	*Colored*
Alabama	8.4	40.0
Arkansas	8.7	28.3
Florida	11.1	56.1
Georgia	8.7	39.1
Kentucky	12.3	63.7
Louisiana	9.8	33.4
Maryland	3.5	28.4
Mississippi	8.9	35.7
North Carolina	5.1	25.0
Oklahoma	8.4	30.7
South Carolina	8.8	18.5
Tennessee	9.7	62.6
Virginia	6.9	25.7

* Mortality statistics, 1930—Bureau of the Census



For 1935 the United States recorded 10,587 homicides with a rate of 8.3. The Dominion of Canada, with approximately 11,000,000 population, had only 153 homicides and a rate of 1.4. During the past year Canada's homicides were reduced to 129 with a rate of 1.3. I have been observing homicide statistics from Canada for some years, and have noted none from Prince Edward Island. I would like to live on that Island, for a while at least.

During the same year, 1935, England and Wales, with a population of over 40,000,000 had 178 homicides, and a rate of 0.4 per 100,000. Scotland with a population of 4,934,000 in the year 1934 had 22 homicides with a rate of 0.45. The homicide rate in the United States is 6½ times the rate in Canada and 20 times the rate on the British Isles. The rate in Mississippi is 64 times the rate in England, Scotland, and Wales.

2. *Penalties*—It seems that homicides are universally classified into 2 major groups, *Murder* and *Manslaughter*. Murder is usually punishable by death—by hanging, by the electric chair, by lethal gas, by gunshot, by beheading, and so forth. Often a life sentence in the penitentiary is substituted. Manslaughter is punishable by imprisonment, all the way from a few days in jail to many years in prison. There is scarcely any method by which we can arrive at a satisfactory conclusion as to how many of the 10,000 homicides in the United States per year are classified as murder and how many of them manslaughter. We only know from figures obtained from the Bureau of the Census that we have 1 legal execution to 75 or 80 homicides. Canada has 1 legal execution in about 9 or 10 homicides. For the 3 years, 1933–1935, Canada made charges of murder against 135 individuals; 58 were sentenced to death; 45 were hanged; and for 10 the sentence was commuted (perhaps to life imprisonment). Exactly one-third of those tried for murder were hanged. I might surmise that of the 10,000 homicides in the United States each year, approximately 4,000 slayers are charged with murder. Since from 160 to 170 are legally executed in the United States, we have about 1/24 of those tried for murder finally executed. A statistical report from the Registrar General of England and Wales for 1935 is highly interesting and instructive, the title being "Murder." In 1935 there were known to the police 87 cases of murder of 101 persons aged 1 year or over. Forty-one committed suicide rather than face the English courts; 21 were found insane—and I believe they were insane when so pronounced in England; 1 died while on remand; 8 were executed; the sentences of 7 were commuted to penal servitude; 3 were discharged at police court, and 6 were acquitted.

Only 9 of the 87 charged with murder escaped. No wonder England and Wales have a homicide rate of only 0.4 per 100,000 population.

CAUSES OF HOMICIDES

1. *Predisposing:* (a) Heredity, (b) Environment, (c) Illiteracy—These are the underlying foundation stones of criminality, including homicides. Of course, we could all discourse for hours on these particular conditions and their relation to the development of citizenship. It is well known that any child well born, well reared, and well educated, will scarcely ever become a voluntary criminal.

2. *Active*—Among the active causes of homicides may be mentioned robbery, revenge, jealousy, gambling, drunkenness, and immorality.

3. But by far the most prevalent cause for homicide, especially in the United States, is the lack of law enforcement. One who runs may read

the truth in this statement in the statistics already given with reference to penalties enforced in the United States against murder as compared to those enforced in the Dominion of Canada and in the British Isles, and to the wide variance in the homicide rates in these particular countries.

H. L. Mencken, writing in *Liberty Magazine* (July 28, 1934), suggested that "the United States try the simple experiment of executing the criminal laws as they stand." "Let them be enforced," he said, "for 1 year running, diligently, resolutely, and according to their letter, and crime will become so hazardous that only actual lunatics will engage in it. Let them be enforced in any given state for even so little as 6 months, and criminals will avoid it."

Our laws are ample and sufficient. Our police apprehend at least 90 per cent of those suspected of crime, and yet with 10,000 homicides in the United States per year we have only about 170 legal executions. At least 2,000 murderers should be executed in the United States every year. There are too few convictions; too much "Sob-Sister Sentimentality"; too many pardons and suspensions; too much lax enforcement of laws against crimes that lead to killing, such as gambling, drunkenness, and carrying concealed weapons. There are too many delays, too many technicalities, too much archaic court procedure, too much dodging of jury service by intelligent citizens, and there are too many shyster lawyers engaged in the highly remunerative practice of defeating justice.

Three or four years ago, I made a study of the homicide situation in Mississippi covering 16 years—1916–1931, inclusive. My information was compiled from our Department of Vital Statistics, showing the number of homicides annually during that time; from the records of the State Penitentiary showing the number of individuals committed for murder and manslaughter and from the office of the Governor where records were found of all pardons granted during the 16 years. The net results of this study show that there were 6,415 homicides, 2,190 convictions, and 871 pardons for homicides. During the time the state population increased 13.5 per cent while homicides increased 66 per cent. Of these 6,415 killers, 4,225 escaped all punishment, 2,190 received more or less punishment, and only 60 were hanged. Twenty-one hundred and ninety were sent to the penitentiary for murder and manslaughter. The manslaughter sentences averaged 9 years and 8 months. About 150 either permanently escaped or died; 330 were pardoned after serving an average of 3½ years; 37 were free under suspension of sentence. Of the 1,083 convicted murderers imprisoned for "life," exactly half were pardoned after serving an average of 7½ years, 297 escaped or died, 74 were free under suspension; only 171 of the 1,083 "lifers" were still in the penitentiary at the close of the time.

I firmly believe that if a like study were made in every state in the Union, we should find similar consequences in a majority of them.

REMEDIES SUGGESTED

I regret very much that my time is so limited that I cannot bring out additional facts with reference to the homicide situation in the United States. It must be conceded by all that our court system needs a radical revision so that it will not rest so heavily upon the foundations of moss-back traditions. It needs to be rejuvenated and made to work with clock-like regularity, so that any suspected criminal may have a speedy trial and receive without delay the just rewards of his transgression. The certainty and speed of

punishment is one of the greatest deterrents to crime. It is my honest conviction that the Constitution should be amended so as to dispense with the Jury System. If we had from 3 to 5 learned and upright judges to hear every case in law, the shyster lawyer would be doomed immediately, and justice would be executed with that swiftness and certainty which we all desire, and which will spell the end of 50 per cent of crime in the United States within 2 years. Practically 90 per cent, if not 95 per cent, of all murder convictions are appealed to the Supreme Court anyway; so why is it not possible for from 3 to 5 judges to pass on the innocence or guilt of the accused in the county in which the deed was committed?

Martyrs to Science

DEATH has claimed the lives of 17 members of Public Health Service personnel as the result of disease contracted in connection with research. These were:

Yellow Fever:

Dr. Roswell H. Waldo, 1878
Dr. W. C. W. Glazier, 1880
Dr. W. T. McAdams, 1889
Dr. John W. Greenvelt, 1891
Dr. J. W. Branham, 1893
Dr. W. M. Wightman, 1909

Typhoid Fever:

Dr. T. F. Richardson, 1906
Dr. William W. Miller, 1908

Tuberculosis:

Bacteriology Technician William Lindgren, 1928 (infected while making transplants of and inoculating animals with virulent human cultures; died 6 years after infection)

Smallpox:

Attendant Mason, about 1921

Rocky Mountain Spotted Fever:

Dr. Thomas B. McClintic, 1912
Laboratory Assistant W. E. Gettinger, 1922
Laboratory Assistant George W. Cowan, 1924
Bacteriologist L. A. Kerlee, 1928

Tularemia:

Laboratory Attendant Martin Lindahl Nolan, 1931

Meningitis:

Nurse Edith M. Hartzel, 1921
Assistant Bacteriologist Anna Pabst, 1935

Psittacosis:

Laboratory Attendant Harry Bernard Anderson, 1930

—*The Health Officer,* Sept., 1937, p. 185.

Vaccines Against the Common Cold*

Are They of Value in the Industrial Health Program?

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IN introducing this subject, attention is called particularly to the form and wording of the subtitle, which implies at the outset that there has been and still is considerable doubt as to the scientific value of vaccines against the common cold. Moreover, it should be noted that the question herein considered is not so much their value in actually preventing the common cold as their possible effect in reducing length and severity of disability from diseases of the upper respiratory system which, as a group, cause the greatest amount of time lost from work among the industrial population, and constitute the chief health problem with which industrial management in general has to contend.

As indicated previously,[1] reducing absenteeism due to colds is an undertaking that requires the coöperative efforts of individual employees and of management. The employees' responsibilities should be concerned with learning everything possible with reference to colds and their prevention, control and medical treatment; and putting the knowledge gained into continuous practice. Management's opportunities in such a coöperative program will be found largely in assisting employees to learn all of the facts regarding colds; in calling attention periodically and seasonally to the seriousness of the problem and the need for medical care; and in adopting certain administrative and supervisory procedures which at least will tend to reduce the duration and severity of these conditions; all of which involves a well rounded program of health education and of health supervision. At the most, the use of vaccines can be but a small part of the program, which should stress particularly the development of good health habits and the building of general resistance to infection.

METHOD OF STUDY

In this study of the possible value of cold vaccines in the reduction of industrial sickness disability, exact scientifically controlled methods of experimentation were impossible. However, in an endeavor to be of some assistance to industrial management and industrial medical departments in their consideration of the subject, a brief survey of the general experience of several associated companies in the Bell Telephone System has been attempted. The data presented are based largely on the opinions and actual experience of management, medical personnel, and employees, formulated over a period of several years, as

* Chairman's Address to be presented before the Industrial Hygiene Section of tht American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

to the possible benefits derived from such vaccines. Until colds are scientifically classified from the standpoint of causes; until the diagnosis, reporting, and treatment of colds come to be medical, rather than personal lay matters; and until accurate statistical data and comparative control records become available, the apparent results achieved through any preventive measure, such as the use of vaccines, must be based on empirical knowledge and generalizations founded on somewhat limited scientific facts.

MATERIALS AND ADMINISTRATIVE PROCEDURE

In all instances covered by this study, standard stock vaccines or serobacterins from cultures of the common pathogenic microörganisms of the respiratory tract, prepared and distributed by various reputable commercial laboratories, have been given according to accepted methods of administration and dosage, the commercial products used differing in each company. In all cases such vaccines were made available only to those employees or their physicians who voluntarily requested them, no particular attempt having been made to promote their use on a company-wide basis. Vaccines have been administered to company employees largely by local practising physicians, an arrangement having been made whereby the companies either supplied the vaccine and paid the physician, or the employee paid a nominal sum to cover the cost of materials used. The chief interest of the companies has been to encourage and to assist in any measure that might decrease sickness disability among employees and to coöperate in making surveys of possible results.

EXPERIENCE OF COMPANIES

Six companies have made vaccines available on the special request of employees or their family physicians, for different lengths of time. The following quotations summarize the general experience of such companies:

Company A—Vaccines made available yearly for the last 6 years to approximately 1,400 employees. A representative states:

> Management has coöperated with employees in a program of cold inoculations. The general results indicate that such vaccines are very effective in certain instances, and wholly ineffective in others. Perhaps fifty-fifty is a measure of their efficiency.

Company B—Vaccines made available yearly for the last 8 years to approximately 2,800 employees. A representative states:

> Results during our 8 years of experience indicate approximately 85 per cent of employees develop some degree of immunity. Briefly, our experience thus far indicates a decidedly worth while advance in the control of colds

Company C—Vaccines made available yearly for the last 17 years to approximately 13,000 employees. The medical director states:

> We send out every spring to each person who was inoculated the previous fall and who is still in our service, a simple questionnaire form which is answered relative to the past season's experience with colds, and returned to us for tabulation and study. Each year there have always been more than one-half who said that they were benefitted. Some years the percentage of absolutely favorable replies has run up to 80 per cent. From 3 to 10 per cent each year report colds as bad or worse than previously, while the balance note no change in the incidence, length or severity of colds.

Company D—Vaccines made available for several years to a very limited number of employees, on request of family physicians. The personnel director states:

> The bulk of opinion is that those inoculated have been somewhat helped—that colds, if suffered, have not been so severe.

Company E—Vaccines made available yearly for the last 5 years to ap-

proximately 1,800 employees. The personnel vice-president states:

Our 5 years' experience has indicated that respiratory disorders may be lessened in severity but not greatly in incidence in the average individual. Vaccines can do no harm when given under strict medical supervision, and certain individuals will derive some degree of benefit.

Company F—Vaccines made available yearly for the last 10 years to approximately 1,100 employees. In one area of this company the medical officer states:

There is every reason to believe that most of those vaccinated against colds have secured relief to some degree.

In another area the medical officer states:

My observations have been that in about 50 per cent of the cases the introduction of a cold vaccine or bacterin, administered early in the fall, seemed to prevent the development of the common cold for a varying period of time. My personal opinion is that so few scientific truths have been obtained definitely to settle the values accrued from the use of these substances that I should not like to put myself on record as stating that they are a true preventive of the common cold.

DISCUSSION

Is it possible to reconcile the varied experiences brought out with the generally accepted facts regarding the etiology of colds and the specificity of immunity? How can a vaccine prepared from cultures of the usual pathogenic microörganisms of the upper respiratory tract, such as pneumococci, streptococci, staphylococci, hemophilus influenzae, and *Micrococcus catarrhalis* stimulate immunity to the common cold, supposedly due to a filterable virus, according to the original suggestion of Kruse,[2] subsequently corroborated by Dochez [3] and his coworkers?

In basing a study of this nature on the experience and history of illness reported by individuals, rather than on accurate medical examinations, diagnosis, and statistical records, the inaccuracies due to faulty memory should be taken into account. An individual, for example, in reporting some months hence on his history of colds for the past season following inoculation will base his conclusions almost entirely on duration and severity, rather than on incidence; a mild coryza of a day or two may be entirely forgotten, while a week's absence from work on account of more severe respiratory illness will be easily remembered. Thus, the favorable effects of inoculations noted by the companies covered may be more significant from the standpoint of reducing length and severity of disability than from that of cutting down the incidence or number of cases.

Results of experimental investigations suggest the probability that the cold virus, whatever its exact identity may be, has the power to activate the bacteria present in the upper respiratory passages. If the virus serves to activate and make more virulent these common pathogenic inhabitants of the nose, throat, and sinuses, and a vaccine made up of secondary bacteria serves to combat or make less virulent these latter organisms, may not one of the ultimate results be an indirect check on the unfavorable influence of the virus itself?

Authorities are fairly well agreed that bacterial vaccines often raise resistance against the secondary disease producing microörganisms, and thus limit inflammation, severity, duration and complications. Kneeland [4] was able to demonstrate experimentally that an intensive course of vaccination with the pathogenic bacteria of the upper respiratory tract modified favorably a winter outbreak of severe respiratory disease in an infant population of a foundling home where scientific control and observations were available. While the incidence or frequency of the com-

mon cold was not affected, the severity was definitely reduced. Niles [5] believes that bacterial vaccines often raise the immunity against the secondary pathogens and thereby limit their invasion of the inflamed tissues, thus reducing severity, duration, and complications of colds. He has not found that autogenous vaccines are superior to the usual stock vaccines. Industry is interested not only in reducing incidence and frequency of sickness among employees, but many, if not most, of its losses in money, time, and efficiency are due to the duration and severity of disability among the working forces.

Any industrial group may be divided roughly into: (1) the cold-proof or those who never seem to have a cold; (2) those with average susceptibility who have one or two minor colds a year; and (3) those cold-prone individuals who suffer from several colds each year, often followed by complications and repeated disability and absence from work. In studies that have been made it has been shown that the cold-prone individuals may approximate as much as 25 per cent of a group. It is they who constitute the continuing year-round reservoirs of the common cold, and who may contribute to the spread of colds that appear in the late fall and winter months. It is primarily at these cold-prone employees that management's program of reducing absenteeism should be aimed. They should be strongly urged, if not required, to seek the guidance, advice, and treatment of their family physicians, in order to reduce to a minimum repeated attacks and prolonged disability and absenteeism, as well as the possibility of being sources of the disease in others. The importance of good health habits, proper ventilation, a daily diet including milk and plenty of fresh fruits and vegetables, as well as extra nourishment through the use of cod liver oil, attention to diseased tonsils or sinuses, increased alkalinization of the body, and ultra-violet radiations, where needed, should be stressed.

SUMMARY AND CONCLUSION

This study of experiences with and results from vaccines against the common cold among workers in industry indicates an apparent reduction in the severity, duration, and complications of acute respiratory diseases. There is little evidence that such vaccines have materially reduced the incidence of the common cold.

Until immunologists can provide us with a vaccine or serum directly to combat the virus and the incidence of the common cold, we possibly shall have to be satisfied with a half-way attack on the acute respiratory diseases in general through the use of vaccines against the well known secondary disease producing bacteria; in so doing we may help to prevent complicating infections and indirectly offset the supposed virulence stimulating action of the virus on these bacteria. To the extent that such vaccines reduce length of disability and absence from work, they apparently may be of some value in the industrial health program. While no one procedure alone, such as the use of vaccines, should be relied upon entirely to build resistance against colds, a broad program of preventive treatment should be encouraged particularly among cold-prone employees, in cooperation with their family physicians.

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Staphylococci in Raw Oysters

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AT the close of 1931, the attention of the San Francisco Department of Public Health was drawn to the shellfish industry as a result of cases of typhoid fever occurring with a frequency considerably above the expected for that period.[1] The use of raw shellfish was admitted by almost 50 per cent of those affected, and epidemiologically this food constituted the most frequent source of possible infection.

The studies that yielded information on real and potential sources of infection were those made on oysters and clams, so the usual routine laboratory examination of oysters was supplemented by examinations for *Staphylococcus aureus* and members of the *B. typhosus* and *B. paratyphosus* group. Previous to this outbreak, inspectors obtained occasional samples of oysters at local wholesale distributing and shucking plants, representative of the oysters shipped from certified areas to San Francisco. Examination for *B. coli* was carried out and corresponding oyster scores were reported routinely.

In December, 1931, *Staphylococcus aureus* was reported in a sample of oysters native to the shores of the Pacific Northwest, also in a sample of foreign frozen clams. Though the sampling of oysters and laboratory examinations continued uninterruptedly on a bi-weekly basis, no finding of staphylococci was noted until the latter part of April, 1937, when *Staphylococcus aureus* was reported in a sample of native California oysters gathered from a small bay 40 miles north of San Francisco. This area had been the source of a large portion of the native oyster supply for the San Francisco market. Careful inquiry elicited no reports of illness from this particular lot of oysters and, furthermore, the entire lot of oysters was consumed before the laboratory report became available. Routine oyster scores from this district had always been well below the maximum allowed for certified oyster beds. Field investigation was immediately made and many samples of oysters were examined. Oysters from other areas were also examined more frequently than usual. Additional positive findings of *Staphylococcus aureus* were reported during May and June, 1937, from oysters taken from the beds 40 miles north of the city as well as from those shipped from the Pacific Northwest, and from so-called eastern oysters transplanted in the waters of San Francisco Bay, southeast of the city.

Sanitary survey of the area north of the city, from which the first staphylococci were reported, indicated a well protected bay, the shores of which were sparsely inhabited and the amount of sewage negligible. There appeared to be sufficient dilution, and favorable currents carried whatever surface drainage was present around and beyond the oyster beds to sea. The area from which oysters were gathered was approximately 3 miles long. The area from the north point of this shore

for a distance of approximately 400 feet south constituted an isolated section from which the positive findings were reported. Samples from other portions of the area were free of contamination. The gathering of oysters from this particular section was prohibited, and continued sampling has to date failed to disclose further positive findings from this source, or from other beds.

SUMMARY

The results in the laboratories of the Department of Health and the George Williams Hooper Foundation of the University of California were practically identical, as follows:

Culture 1, isolated from unshucked oysters, source S.B., produced no toxin.

Culture 2, source S.B., generated toxic substance which, on intraperitoneal inoculation of kittens, induced vomiting twice after 75 minutes.

Culture 3, from oysters, O. type, and *Culture 4* from oysters, P. type, also *Culture 5* from the same sources, all proved to be nontoxic.

The toxin was prepared in the most suitable medium containing starch and incubated under carbon dioxide. In order to prove that these cultures might produce poison in an oyster medium, oyster infusion was prepared but, although the organism grew very well at 37° in the medium, no toxin was demonstrable.

From these observations it is possible to conclude that although occasionally toxin producing staphylococci may be found in oysters, they are unable to grow in oysters and cannot produce toxin injurious to human beings. These observations are substantiated by the epidemiologic facts.

DISCUSSION

In December, 1931, and again in April, May, and June, 1937, *Staphylococcus aureus* was reported positive in samples of oysters of several types from the various districts supplying shellfish to the San Francisco market. Sanitary survey of these areas did not disclose any particular sewage or drainage affecting the oyster beds.

Experiments on animals with cultures of *Staphylococcus aureus* isolated from the oysters proved the cultures to be non-toxic or mildly toxic to kittens after intraperitoneal injections. Epidemiologic findings fully substantiated the laboratory results.

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A Bacteriological Survey of Telephone Instruments under Various Conditions of Use

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THE possibility that the use of the telephone instrument may be a factor in the spread of communicable disease has engaged medical attention for many years.

A number of studies have been made of the bacterial flora of telephone instruments in both public and private use, in the belief that data on the numbers and types of bacteria, especially pathogenic varieties, which may be cultivated from the telephone instrument would serve as a valid basis for conclusions as to any sanitary risk there may be in using the telephone. The conclusions which have been drawn from these studies have been widely divergent. Some investigators have concluded that the telephone may be an active agent in the spread of disease, while others regard the risk as slight or negligible.

The pathogenic bacteria whose transmission by the telephone has been thought to be possible had been discovered many years before the first bacteriologic studies of the telephone were made, and the technical procedures required for their successful cultivation have been available to bacteriologists generally. Uncertainty as to the existence of any sanitary hazard of the telephone might therefore be thought to depend on the difficulty of interpretation, rather than on the incompleteness or the unreliability of the bacteriologic data.

A review of the literature of the subject, however, including a number of reports of special investigations, discloses a lack of agreement among the various authors as to the occurrence of pathogenic bacteria upon the telephone instrument. It is worthy of note that no positive findings (with one possible exception) of pathogenic bacteria were reported from the earlier studies, while the later investigators, beginning with Saelhof [1] in 1921, have been able to recover pathogens from the telephone. The earlier workers appear to have assumed that their technical methods were suitable for the recovery of pathogenic bacteria, but no tests were made, so far as we have been able to ascertain, to prove that this was the case. The possibility that the technical methods in common use might be inadequate for this purpose was first mentioned by Vasica and his associates [2] in 1933. Doubt on this point is implied, moreover, by the action of each successive investigator in carrying out bacteriologic studies with little or no reference to preceding reports.

It seemed necessary, therefore, as a first step in the present investigation, to undertake an independent study of

the bacteria found on the telephone instrument and to make use of methods of culture which would leave no room for criticism as to their adequacy.

It was the aim of the present survey to secure information as to the bacterial flora present on telephone instruments under the ordinary conditions of use. No consideration has been given in the studies reported here, to filterable viruses.

The selection of telephone instruments for examination was so made as to include situations which afforded a wide range of environment, such as the geographical location within the city, the frequency of use, and the exposure of the instrument to humidity, heat, light, dust, or other physical factors. Two hundred and forty-six instruments were examined in New York City. The majority of these were public. They were situated in office buildings, department stores and small shops, in hospital operating rooms, dispensaries and laboratories; in the Interborough Subway, and in the New York Central and Pennsylvania Railway Terminal buildings. The telephone instruments were situated in exposed locations in corridors or office rooms, or were located in booths which stood separately or in groups as in the larger buildings. In many instances statistics were available as to the number of out-going calls made over the instrument studied; these ranged from very small numbers to approximately 6,300 per month. Cultures were made every month of the year from January 1, 1935, through June, 1936. A number of examinations were made of telephone instruments elsewhere than in New York City which supplied corroborative evidence.

Throughout we endeavored to maintain in the field the same care in technic as exercised in the laboratory. Cultures were taken with a sterile swab moistened in sterile nutrient broth. The inner surface and rim of the mouthpiece, or the outer surfaces of the earpiece were wiped with the moistened swab. A portion of the surface of a blood agar plate was streaked with the swab and the inoculum then spread evenly over the plate with a platinum loop sterilized in the flame of an alcohol lamp. If the swab was streaked over the entire surface the colonies were usually so numerous that enumeration and isolation in pure culture was impossible. Uniform technic was maintained to make sure that the results of experiments made at different times and on different telephones would be comparable.

The plating medium was hormone agar enriched with 5 per cent defibrinated rabbit blood and in some cases with 0.25 per cent dextrose to favor the growth of the mucoid phase of the bacterial colony. The blood agar plates were prepared a short time before leaving the laboratory, and kept sealed with adhesive tape during transport to avoid drying and contamination. While it was not necessary to use a rich medium for the recovery of saprophytic forms, the medium used was the most favorable for the isolation of pathogenic bacteria found in the human upper respiratory tract.

The plates were incubated at 37° C., since this would favor the growth of pathogens or closely related forms. A lower temperature would have favored the growth of saprophytic organisms which, according to Vasica, *et al.*, outgrew the organisms developing at 37° in the ratio of 2½ to 1. Several colonies of each type of microörganism were fished, and identification was made according to *Bergey's Manual*, and in some cases by serological methods.

After streaking the plates the swabs were placed in a medium consisting of hormone broth with 10 per cent normal horse serum and 1 part in 500,000 of

gentian violet (Carrod [3]), which facilitates the isolation of the hemolytic streptococcus from mixed culture. After 18 hours' incubation at 37° C. rabbit blood agar plates were inoculated with a loopful of the broth culture. If hemolytic streptococci were found, colonies were fished to broth tubes, incubated, replated for purity, and kept as stock cultures in blood broth.

The numerical results are summarized in Table I. The data are grouped according to the season of the year and by the number of outgoing calls per month made on the instrument examined. The counts do not represent the total number of organisms on the mouthpieces but are based on the technic described above. Since this technic was carried out with particular attention to its uniformity, the counts are comparable among themselves and represent a constant fraction of the total number of organisms actually present.

showed small differences within a single group, while the average values of the various groups showed considerably greater differences. In the Radio Corporation of America Building, for example, a series of 7 booths gave counts below 60 per instrument with an average of 32, while in the Long Island Railroad Station the figures for 5 instruments lay between 132 and 924, with an average of 500. The difference between these two series may be due to the fact that in the former the telephone booths are in compartments which are supplied continuously with air freed of dust by " air-conditioning," while in the latter the dust from the concourse may be carried readily into the booths.

In general the numbers of bacteria found on telephone instruments in widely separated localities and in various surroundings showed small differences, and our attempts to establish a correlation between the total numbers

TABLE I

Classification by Frequency of Use of Instrument of Data Obtained from Bacteriological Examination of Telephone Mouthpieces—December, 1934, to October, 1936

Number of Calls per Month	*Number of Telephone Mouthpieces Examined*	*Counts*			*Total Streptococci*	*Total Other Pathogens*
		Highest	*Lowest*	*Median*		
Less than 100	131	1,000	0	43	49	26
100– 500	22	1,000	10	30	2	4
500–1,000	42	2,000	2	54	5	24
1,000–2,000	24	920	1	130	7	11
2,000–4,000	15	300	7	59	3	1
4,000–6,000	11	730	24	170	1	1
Over 6,000	1	160	..	...	0	1
Total	216	2,000	0	53	67	68

In grouping the data the environment of the instruments has been ignored since a study from this point of view showed that no consistently significant difference in counts could be demonstrated. In some instances, it is true, the numbers of bacteria obtained from telephones in booths grouped closely in one corridor or floor

of bacteria and any characteristic of the environment met with little success. On the basis of the social and economic status of the patrons, the telephones on the lower East Side of New York City may be contrasted with those in the R.C.A. Building. In the former locality, telephones in diverse situations including a public bar, small shops and

restaurants, gave an average value nearly as low as did those in the air-conditioned R.C.A. Building.

In a small number of cases, enumerations of the bacteria on the earpieces gave figures considerably higher than those for the corresponding mouthpieces in the average ratio of 3 to 1.

Our results are recorded in Table II. They are contrary to those of Saelhof and of Thiroux and Rissler [4] who found many more bacteria on the mouthpieces than on the corresponding receivers.

The same attitude was taken toward the numerous varieties of sarcina recovered, many of them pigment formers.

Diphtheroid bacilli belonging to the *C. xerosis* of *C. hoffmannii* groups were encountered in the plates made from almost every instrument. The true diphtheria bacillus was not recovered in a single instance. Although Loeffler's blood serum was not used as a selective medium, our use of blood agar plates should have made the recovery of this microörganism possible if it were present.

TABLE II

Classification, by Frequency of Use of Instrument, of Data Obtained from Bacteriological Examination of Earpieces

Number of Calls per Month	*Number of Telephone Earpieces Examined*	*Counts*			*Total Streptococci*	*Total Other Pathogens*
		Highest	*Lowest*	*Median*		
Winter 1934–5						
Less than 100	2	197	90	144*	0	0
300–1,000	1	19	..	19	0	1
Total	3	197	19	90	0	1
Spring 1935						
Less than 100	6	6,000	15	360	0	0
Summer 1935						
Less than 100	3	32	5	19†	0	1
Winter 1935–6						
Less than 100	3	46	19	27	0	7
500–1,000	1	1,440	..	..	0	4
Total	4	1,440	19	25	0	11
Summary	16	6,000	5	..	0	14

* Mean instead of Median
† Based on two instead of three figures

The bacteria recovered from instruments represent many genera and species. The genus Micrococcus yielded the largest numbers both of species and individuals. This observation was made also by Vasica and his associates who distinguished numerous species of cocci on the basis of pigment production. Although the range of chromogenesis in our cultures was wide, it did not seem profitable to attempt a sub-division of the cocci on this basis.

Gram-negative diplococci, belonging in all probability to the genus Neisseria, were found with about the same frequency as the diphtheroid bacilli. Streptococci, including hemolytic and non-hemolytic varieties, and pneumococci were occasionally found. These will be considered in detail in a later section.

Members of the subtilis group were encountered very frequently, being present almost invariably on mouth-

pieces which were covered with dust. With this exception it was not possible to correlate the presence of bacteria of any of the groups mentioned with any feature of the environment.

No attempt was made to recover the tubercle bacillus. It was felt that this could be properly attempted only when made the subject of a special investigation.

With regard to the origin of the various microörganisms recovered, our knowledge is very incomplete. It is known that the bacilli of the subtilis group have their home in the soil and other locations outside the human body. Cocci of the types recovered as well as diphtheroid bacilli are found with great frequency in cultures made from the throats of healthy human beings. It was not certain, however, that their occurrence on the telephone was from this source.

In the hope of throwing light on this and on other points, experiments were carried out in which conversations were held over a telephone system installed in the laboratory with the transmitters placed in opposite corners of a large room. The mouthpieces were sterilized, and were cultured immediately after use. The experiments were repeated with many variations, in the endeavor to reproduce the conditions of actual practice. The length of the conversation, the pitch of the voice, and the character of words used were varied. More than 10 different individuals took part in the experiments.

Two types of mouthpieces were used, black bakelite and glass. These were cleaned and sterilized, and used without further treatment. They were cultured by swabbing as described. A number of experiments were carried on with mouthpieces of these two types which had been covered with nutrient agar. The coating of plain or rabbit blood agar was applied by dipping in melted agar, or by pouring the agar into the space left between the inner surface of the conical portion of the mouthpiece and a sterile paper cone, which was removed as soon as the agar had congealed. Immediately after use the agar covered mouthpieces were placed in dust-proof sterile containers and incubated. By counting the colonies that developed on the agar the actual number of bacteria deposited was determined directly. This method had the further advantage of avoiding exposure of the bacteria to drying or other deleterious influences, and lessened the possibility of change in the colonial type (M, S or R).

The types of bacteria recovered with sterilized mouthpieces were of the same varieties as those found in the field survey, and here also saprophytes predominated. These varieties may be obtained by direct culture of the nasopharynx of the majority of healthy individuals, and it is evident that some of the bacteria which occur on telephones come from this source. In a number of cases in which the speaker was known to be carrying a pathogen, this microörganism was recovered from the mouthpiece.

Large differences were noted in the number of colonies on the mouthpieces used by different individuals, both when the enumerations were made by swabbing the mouthpieces and streaking agar plates, or by direct counts of the colonies on the agar covered mouthpieces. Some individuals gave low counts with regularity, while others gave consistently high ones. In different conversations of a given individual relatively large numbers were deposited when sibilant sounds were especially numerous or were spoken with particular emphasis, due to variations in the amount of saliva thrown out in droplets.

The counts obtained after a 3 minute conversation ranged from low to the neighborhood of 2,500; counts between

20 and 200 were more frequent than either smaller or larger. Since uniform methods were used in this part of the work and in the city-wide survey, it seems possible to say that the numbers found on the mouthpiece of a public telephone are frequently such as might have been deposited during a single conversation.

Inasmuch as the great majority of the bacteria found on telephone mouthpieces are saprophytic forms which tend to overgrow pathogens in cultures, in order to detect pathogenic varieties it was necessary to use the special procedures described in the section on technic. No one technic or culture medium is suitable for the recovery of all of the varieties of pathogens which occur in the oro-pharynx and might be deposited upon the telephone instrument, but the use of rabbit blood agar plates permitted the recovery of certain common varieties.

Although diphtheroid bacilli were encountered frequently, no true diphtheria bacilli were found. Among the Neisseria which appeared frequently there may have been forms identical with or closely related to the meningococcus. There is so much uncertainty as to the significance of the diplococci in the oro-pharynx which are culturally indistinguishable from the meningococcus, that it did not seem advisable to study these bacteria in detail. Interpretation of the sanitary significance of these groups at present is subject to serious limitation.

Potential pathogens of the pneumococcus and streptococcus groups, however, can be identified with little difficulty. They deserve especial consideration because of the extent and the variety of the diseases which they produce, and because the upper respiratory tract is frequently the portal of entry for infection. Particular attention was accordingly paid to the recovery of these varieties.

Pneumococci were cultured from the transmitters less frequently than either the staphylococcus or the streptococcus. They appeared only in specimens collected in the winter and spring, and their occurrence, therefore, bears a significant relation to the seasonal peak of pneumococcus infection in New York City. Pneumococci were found in considerable numbers (in 19 instruments, or 52 per cent) in a survey made in March, 1936, and in a culture from 1 instrument, out of 125 colonies, 110 were the pneumococcus. In the cultures from another transmitter 4 of 7 colonies were pneumococcus. It was not possible to determine with any certainty the type of the pneumococci recovered because the antisera available were not sharply type specific, and the demands of other phases of our investigation made it impossible to carry the typing to a satisfactory conclusion.

Hemolytic streptococci were recovered from telephone mouthpieces with considerably greater frequency than were pneumococci. In cultures from 246 telephone instruments, this streptococcus was found in 67. No relation could be made out between the location of a telephone or any characteristic of its environment, and the presence of this organism, but there was a marked seasonal variation. It was present in only a few instances in the summer or autumn, with the exception of August, 1935. During the winter and spring, the streptococcus appeared frequently on telephone instruments, corresponding to the rise in the incidence of the streptococcus in the general population, as found in our observations and those of our colleagues (Coburn and Pauli). On January 21, cultures were made from 7 telephone instruments, 6 of them yielding the hemolytic streptococcus, and not only were the total numbers of bacteria of all sorts greater, but the

percentage of the hemolytic streptococcus was higher than in a survey made earlier in the month when the streptococcus was present on only 6 of 14 instruments examined. These findings can be interpreted in the light of the observation of Coburn and Pauli (personal communication) that during the week January 15–22, 1936, the incidence of the hemolytic streptococcus in the oro-pharynx in a group of patients in a convalescent home, showed a 40 per cent rise over that in the preceding week. On February 2, 1936, 18 out of 26 telephone instruments yielded the hemolytic streptococcus. In cultures made during March, 1936, pneumococci were more numerous than streptococci. A large number of hemolytic streptococci also were found during this period, in some cases the plates showing almost pure cultures of this microörganism. In April no recoveries of hemolytic streptococci were made from the telephone instruments. This corresponded to the decrease reported in the incidence of this pathogen in the oro-pharynx of patients in a dispensary in the city. Only 8 of 45 patients examined on April 24, 1936, were carriers of the hemolytic streptococcus, and in 2 of these, throat cultures yielded only 1 or 2 colonies per plate.

These observations indicate that the incidence of the hemolytic streptococcus on the telephone rises and falls with the incidence of the streptococcus in the oro-pharynx of persons in the community and the incidence of streptococcus disease.

Four strains of streptococcus were tested for virulence in white mice, by the inoculation of a 12 hour broth culture in amounts from 0.5 to 0.000001 c.c. None of the mice succumbed. The lack of virulence may have been due to the fact that all were in the SR phase, as manifested by their colonial forms. Other strains exhibited on first isolation mucoid, matt, smooth, or partially rough phases. No attempt was made to carry out virulence determinations on these strains.

A number of experiments were carried out with known carriers of pathogenic bacteria to find out if the pathogen could be recovered from telephone instruments used by them. A research worker suffering from an acute infection of a nasal sinus due to pneumococcus Type I, left this microörganism on the instrument. Another worker, speaking when ill with a streptococcus angina, left hemolytic streptococci on the mouthpiece. During her convalescence in the hospital, the streptococcus colonies diminished in number both in the cultures from the throat and from the telephone mouthpiece. They were absent from cultures taken shortly before discharge.

The hemolytic streptococcus was recovered also from mouthpieces used by patients while recovering from acute rheumatic fever, and from tonsillitis due presumably to the hemolytic streptococcus. In two experiments from 3 to 23 streptococcus colonies were recovered from telephone mouthpieces after 3 minute conversations.

A more extensive investigation was made in the case of a family of 5, all of whom were suffering from upper respiratory infections. Two members were found to be carrying pneumococcus Type II, while 2 others had hemolytic streptococcus Group A Type 28 (Griffith [6]). Both of these microorganisms were recovered from the home telephone. The streptococcus was recovered also from the office telephone used by 1 of the 2 who were carrying the microörganism.

Preliminary steps have been taken to carry out a serological classification of the streptococci recovered from telephone instruments in cases in which nothing was known as to the source of the microörganism. The studies of Lancefield,[9] Griffith, and Hare [10] have

provided the basis for this classification. Our work has been carried only far enough to show that members of Group A, which includes the great majority of strains pathogenic for man, and of Group C, may occur on public telephone instruments.

In order to determine whether bacteria can be dislodged from the mouthpiece during a conversation, an attempt was made to blow off bacteria from mouthpieces after ordinary usage, and from others which had been sterilized and then sprayed with broth culture of streptococcus. One end of a glass tube was blown out into the shape of human lips; to the other end a rubber bulb was attached. This was compressed to emit puffs of air approximately equal in force to those made in speaking. The artificial lips were placed in front of a mouthpiece and a Petri dish containing blood agar was held immediately behind the device. The bulb was compressed repeatedly during 1 to 3 minutes. After incubation the colonies on the plates were counted.

Three mouthpieces were taken from instruments near the laboratory; from the first 7 bacteria were dislodged, from the second, 3, and from the third, 2. The mouthpieces were then cultured to determine the approximate number remaining. In the order given, 124, 62, and 56 colonies were obtained, which indicates that only a very small percentage of the bacteria present were dislodged.

In a second experiment a hemolytic streptococcus culture was sprayed on the transmitters. Some of them were placed in dustproof containers and allowed to dry overnight at room temperature, others were tested while moist. From the mouthpieces on which the culture had been allowed to dry, from 1 to 8 colonies of bacteria commonly recognized as saprophytic were found on the culture plates, but no colonies of streptococci. This negative result indicates that streptococci are not easily dislodged after being dried on such a surface.

Three mouthpieces were tested immediately after spraying. The cultures from 2 were sterile, in 1, 2 colonies of the original streptococcus appeared. Further study and the elaboration of a technic for depositing known numbers of bacteria is required for evaluation of such experiments. The limited number of experiments indicates merely that bacteria may be dislodged in small numbers from telephone transmitters. Muller [7] has made similar observations.

Little information is available as to the viability of pathogenic bacteria on the telephone transmitter. In one experiment sterile mouthpieces were contaminated with a broth culture of a hemolytic streptococcus from scarlet fever, which was in the mucoid stage and virulent for mice in amounts of 0.00000001 c.c. Cultures were made daily from the mouthpiece, and streptococci were recovered on 4 successive days. The microörganism appeared in the SM phase showing that it had dissociated. It had begun to lose its virulence for mice, as the smallest lethal dose was 0.001 c.c. In another experiment the streptococcus remained viable for 11 days, by which time the numbers of organisms had diminished greatly, only 2 colonies being obtained from 11 mouthpieces. The relative humidity varied between 47 per cent and 62 per cent, and the outdoor temperature from 33° to 25° C. The streptococcus remained in the mucoid stage.

DISCUSSION AND SUMMARY

This investigation was undertaken to secure information regarding the occurrence of bacteria on the telephone instrument under the conditions of ordinary use, as the basis for an estimate of any sanitary hazard which might be involved in its use.

A bacteriological survey was made of telephone instruments in a wide variety of situations in and about New York City. Cultures were made from mouthpieces and in a small number of cases, from the earpieces. The cultural methods were especially adapted to the recovery of pathogenic forms, but permitted the growth of other types. Many varieties of bacteria were recovered. The great majority were saprophytes, belonging to types found in the air, and which are present in the oro-pharynx of human beings. The bacteria on telephone instruments are presumably derived from these sources.

Our observations indicate that bacteria are not more numerous on telephones in one location than in another. We were not able to discover any relation between the frequency of use of a telephone and the number of bacteria present. Since the number of bacteria which may be recovered from a telephone in constant use is often no greater than the number which may be deposited in a single conversation it is evident that there is no tendency toward the accumulation of living bacteria on the transmitter. Our observations are in agreement with those of Vasica, *et al.*, that the total numbers of bacteria are not greater on transmitters visibly covered with dust than on those which appear clean.

A question of fundamental importance in seeking for a possible sanitary hazard in the use of the telephone is whether the bacteria found are pathogenic for man. The respiratory pathogens, of which the pneumococcus and hemolytic streptococcus may be regarded as the most important, because of the frequency and the variety of the diseases which they cause, demand first consideration.

Our results in the recovery of these forms are in agreement in general with those of the less extensive surveys made by Saelhof [1] and by the National Pathologic Laboratory of New York City.[8] The pneumococcus was found only in cultures made during winter and spring, when disease due to this microörganism is most prevalent. The hemolytic streptococcus was recovered with greater frequency than the pneumococcus. The same seasonal occurrence was noted for the hemolytic streptococcus as for the pneumococcus; hemolytic streptococcus was recovered most frequently during the winter and spring and showed its highest incidence at times when streptococcus disease was most prevalent in the community.

Although these observations were made in a large number of instances and cannot be regarded as fortuitous, the interpretation of their sanitary significance is not a simple matter. Many cocci which must be placed in the pneumococcus and streptococcus groups have low pathogenicity, or none that can be demonstrated, either for man or for laboratory animals. They are frequently designated as mouth-strains in contrast to the disease producing strains which are recovered from infections. An advance in our understanding of this problem in the case of hemolytic streptococcus has come through the work of Lancefield,[9] Griffith,[6] and Hare,[10] who have been able by serological reactions to distinguish groups of the streptococcus of which only certain ones have high pathogenic significance for man. Members of Group A are responsible for the majority of the cases of human streptococcus infection. This group includes 28 or more types (Griffith), certain of which are associated with particular disease complexes such as scarlatina, erysipelas, etc.

Members of the other groups rarely cause disease. It is necessary to know the serological group to which a streptococcus belongs before its sanitary significance can be estimated. This need was recognized early and the

preparation of group- and type-specific sera was undertaken. Among the streptococcus strains recovered from telephone instruments, have been found representatives of Groups A and C. It is our hope to be able to complete our bacteriological survey by making serological identifications of all the recovered strains of hemolytic streptococci.

Even when such information is available, both for the streptococcus and for other pathogenic organisms, a second and much more difficult problem must be solved before the pathogenic organisms which may be found on a telephone instrument can be considered as transmitters of disease.

Only in recent years have data been obtained on the occurrence of respiratory pathogens outside the human body. Stillman [11] of the Rockefeller Institute has found pneumococci in the dust of rooms occupied by pneumonia patients, and White [12] has obtained streptococci in cultures from sweepings of rooms and wards occupied by persons suffering from hemolytic streptococcus infections. We do not have any means for estimating the extent to which disease is caused by bacteria from such locations. While it is possible that on occasion hemolytic streptococci clinging to dust particles in the corners of a room, or on the mouthpiece of a telephone, are dislodged by currents of air and carried into the respiratory passages of a human being, infection may not be caused by this but may result only when the microörganisms are implanted upon the mucous membranes of the nose and throat by direct transmission from person to person. Moreover, the resistance of the individuals in any population group to the streptococcus must vary with the type of microörganism and its previous occurrence within the group. It must seem in consequence necessary not only to identify by serologic means the streptococci which may be found on a telephone, but also to determine the distribution of the streptococcus types among a population. It is, we believe, only through large-scale surveys, such as that being undertaken by Gordon [13] in Roumania, that we can learn the facts necessary for an understanding of the sanitary significance of the streptococcus in a population group.

In the absence of specific bacteriological information, the public health problem of the telephone can be approached only on general grounds. Respiratory infection has been traced in rare instances from one person to another, but the exact means of transport of the infectious agent has not been demonstrated. If droplet nuclei, which Wells [14] has found to remain suspended for a considerable time in the air, should prove to be the most important factor in the spread of infection, it would be necessary to regard the air within a telephone booth, for example, as a greater source of danger than the instrument itself, and we should have to believe that the telephone and its appurtenances have but a small share in the spread of disease.

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Is Routine Examination and Certification of Food Handlers Worth While?*

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ALTHOUGH the control of food handlers with communicable diseases was first attempted by the Board of Health of New York City as early as 1916, compulsory annual medical examination was not required until March, 1923.

The first amendment to the Sanitary Code provided that food handlers with communicable diseases shall not be employed and further that any food handler may be examined at any time at the discretion of the Department of Health. After an experience of 18 years with medical examinations of food handlers in New York City, during the last 11 of which annual examination and certification of all food handlers was compulsory, by amendment to the Sanitary Code in September, 1934, such examination and certification was discontinued. This action of the Board of Health was based on the following considerations:

1. The examination of food handlers by private physicians cannot be accepted as reliable.
2. The cost of physical examinations of food handlers made exclusively by the Department of Health is not commensurate with the public health benefits obtained.
3. The most careful physical examination does not reveal the most important conditions that may be transmitted by food handling.
4. In order to be able to certify that a food handler is free from communicable disease, at least a chest X-ray, a Wassermann, and a stool examination for typhoid, paratyphoid and amebic and bacillary dysentery carrier must be made. The cost of such an examination is almost prohibitive.
5. Even if such a complete examination were made, there is no assurance that the food handler would remain free of communicable disease during the tenure of the certificate.
6. Too much emphasis has been placed on the value of medical examinations as a means of preventing the spread of disease through food handling, especially as it relates to such communicable conditions as venereal diseases, tuberculosis and skin conditions.

Consideration 1—Private physicians' examinations—In New York City, in each of the 5 boroughs, we conducted a clinic where food handlers were examined and certificates issued without fee. Those who did not wish the inconvenience and the loss of time by coming to the clinic were permitted to employ a physician who made the physical examination, filled out the required form and forwarded it to the Department of Health. If the physical examination disclosed no communicable condition, the food handler certificate (a department form) was issued to the applicant. If a suspicious communicable condition was disclosed, the food handler was further examined at the food handlers' clinic and final disposition made. The question arises, should a department of health certify to the freedom from communicable dis-

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ease in a food handler as a result of an examination by a private physician over whom it has no jurisdiction or control? You may draw your own conclusions from the following tabulation of examinations for the last year during which such examinations were made in accordance with the above procedure.

TABLE I

	Private Physicians	*Dept. of Health Clinics*
Examined	219,282	108,176
Held for Observation		
Tuberculosis	37	623
Venereal disease	89	1,692
Typhoid carrier	293	1,438
Skin diseases	20	73
Total	439	3,826
Rate	200 per 100,000	3,540 per 100,000
Excluded		
Tuberculosis	2	39
Venereal disease	4	146
Typhoid carrier	0	2
Skin disease	0	52
Total	6	239
Rate	3 per 100,000	221 per 100,000

The department clinics held for observation over 17 times as many food handlers as did private physicians, and excluded over 70 times as many.

How could it be otherwise when it was a well known practice for physicians to solicit the examinations from store to store, either themselves or by a representative, and make examinations in the rear of the store or across the counter.

Consideration 2—Cost of examination in comparison to benefits—The cost to the Department of Health of maintaining clinics, when we were examining only one-third of the total food handlers was approximately $43,000 annually. The cost of examining all food handlers, approximately one-third of a million, can be conservatively placed at $100,000. It might be held that a fee should be charged to defray the expense of such a program. Whether the taxpayer or the food handler himself foots the bill is not germane to the present discussion. The question remains—what return in public health protection would accrue from the expenditure of such a sum of money? Referring again to our tabulation, the only individuals discovered who might be considered a health menace through food handling are the two typhoid carriers. If the Department of Health had conducted all the examinations during this period at the conservative estimate of $100,000, the cost per typhoid carrier would have been $50,000. Since two-thirds of these examinations were made by private physicians, the usual fee being $1 per examination, the cost may be calculated at approximately $260,000, or $130,000 per carrier. I submit, is such a cost commensurate with the public health benefits obtained? The value of public health work is measured by the degree to which sickness and death in a community are reduced, and the desirability of adopting any particular program must be gauged by the comparative yield for the outlay in effort and money.

Considerations 3 and 4—Communicable diseases revealed depend on the method of examination—Cases of tuberculosis can be missed, even by a careful examiner without an X-ray. Cases of syphilis without lesions can be found only by means of a Wassermann test. Carriers of enteric conditions can be determined only by routine laboratory stool examination. Therefore, in order to certify a food handler as free from communicable disease, there should be, in addition to the physical examination of each food handler, a routine chest X-ray, a Wassermann, and at least one stool

examination for typhoid, paratyphoid, amebic and bacillary dysentery. Assuming that there is some measure of public health protection if such an examination is made, the cost to the Department of Health can conservatively be estimated at a minimum of $4 per examination. If the examination is made by a private physician and private laboratory, the cost would probably be nearer $15 to the food handler, a prohibitive cost. This might be cut down on reëxamination by dispensing with the stool examination. At $4 per examination, the cost would be approximately 1⅓ million dollars annually, or about one-fourth of our present budget. Can you visualize 1,000 roentgenograms, Wassermanns, and typhoid stool examinations daily in addition to our routine work in these fields? Should the "governing body" of your community suddenly become very generous and grant you an additional amount of money equivalent to one-fourth of your present budget, what health service would you want to render your community with such funds? Would you expend this sum on food handler examinations?

Consideration 5—Healthy food handlers may become infected soon after certification—Assuming that all communicable conditions that may be a public health menace through food handling are found as the result of proper examination, and that in spite of the great cost this *is* desirable, what assurance can we have that food handlers will be free from communicable disease for the ensuing year, or whatever the tenure of the certification may be? And yet it has been the practice to give a food handler a certificate good for a period of time to the effect that he is free from communicable disease over this entire period. Is this not giving the public a false sense of security? Is this not pure camouflage?

Consideration 6—Many communicable diseases are not spread by food—With the exception of the enteric conditions, the possibility of transmitting disease by food handling is rather remote. Communicable skin conditions, tuberculosis, syphilis and gonorrhea are just not contracted that way. In the case of enteric diseases, there are other effective methods which, if employed, will give reasonable protection to the public against carriers of these diseases.

It may be observed that this discussion applies in the main to a large city such as New York. It is our contention, however, that the fundamental principles involved apply more or less to any community large or small. There is only a difference in degree.

What then can be done to protect the public against infection from food handlers?

1. Prompt reporting of communicable diseases, giving the occupation of the individual. If a food handler is suffering from a condition in communicable form, he can be immediately excluded from work and kept under supervision until it is safe for him to return. By this procedure, too, food handler contacts with certain communicable diseases may also be excluded from work.

2. By thorough epidemiological investigation and follow-up of cases of typhoid fever, infected food handlers should be discovered. As of July 1, 1937, we had listed in New York City 727 typhoid carriers. Of this number, 397 were discovered as the result of epidemiological investigation; 270 were listed as the result of persistence of positive stools after recovery from typhoid; 35 as the result of food handler examinations; 23 as the result of operative procedures. It can be seen from this that the most important factor in detecting typhoid carriers is the epidemiological investigation. Of the 35 carriers found as the result of food

handlers' examinations, 23 were found during the 11 year period of compulsory annual examinations. Of the 397 carriers discovered as the result of epidemiological investigation, 28 were food handlers. Of these 28, 18 were discovered during the same 11 year period of compulsory annual examination. Apparently, then, 18 food handler carriers discovered by epidemiological investigation had been missed by the routine examination of food handlers.

In spite of the fact that food handler examinations were discontinued in New York City in September, 1934, there has been a constant diminution in typhoid fever as shown by the following table:

	1933	*1934*	*1935*	*1936*
Cases	557	332	314	305

It would seem that food handler typhoid carriers in New York City have not been an important health menace during this period.

3. Exclusion and strict supervision of food handler typhoid carriers and food handler members of their families.

4. Education of food handlers—

a. *Instruction in personal hygiene* —Clean hands are perhaps the most important yet simplest expedient to prevent food contamination. To this end, adequate washing facilities conveniently located with soap, running hot water, and clean towels must be provided in all food establishments.

b. Instruction in handling food, namely the use of tongs, and forks, thereby minimizing the handling of foods with bare hands.

c. Placards of instruction to food handlers posted in wash rooms, and pamphlets of instruction distributed by food inspectors in the course of their routine duties.

5. Lastly, to impress upon employer and employee alike that they are jointly responsible for violating the law if a food handler with a communicable disease is found employed.

These, then, are the things we can do and should do.



ANNUAL ROLL CALL
NOVEMBER 11–25, 1937

Scoops as a Source of Contamination of Ice Cream in Retail Stores

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A COMPARATIVE study of the results of routine ice cream analyses conducted at Plainfield, N. J., over several years showed that the bacterial counts of loose ice cream were in most instances considerably higher than those of the same product manufactured and packaged at the same plant and dispensed by the same dealer. As a result we endeavored to ascertain the reason for the increased number of bacteria in bulk ice cream.

Our former procedure for sampling ice cream was carried out as follows:

Two samples of the same bulk ice cream were obtained and placed in sterile screw cap jars. The first was taken with the vendor's scoop in the manner that it would be served to the customer in an ice cream cone or dish. The second was taken with a sterile tablespoon from the freshly exposed sub-surface after at least 1 inch of the surface layer had been removed by scraping with one sweep of another sterile tablespoon.

The samples were transported to the laboratory in a refrigerated case and liquefied with as little heat as possible. One c.c. of a 1:1,000 dilution was planted on standard nutrient agar and the plates incubated at 37° C. for 48 hours. Although this method of plating does not conform with Standard Methods, it was found to be practical for the purpose of comparison:

Bacterial counts were invariably higher in scoop samples, in many instances from 50 to 300 per cent.

TABLE I

Counts on Samples Taken with Vendor's Scoop	*Counts on Samples Taken with Sterile Spoon*
640,000	8,000
320,000	23,000
512,000	3,000
158,000	28,000
121,000	3,000
113,000	10,000
19,000	2,000
175,000	11,000

From these findings it was apparent that there was considerable surface contamination of ice creams which were being dispensed in retail stores from bulk containers, but we could not conclusively demonstrate the factor of contamination although the vendor's scoop was suspected. To ascertain whether the scoop or dispensing spoon was the source of contamination we took ice cream samples as follows:

The inspectors were equipped with kits containing a large jar of sterile tablespoons, a number of sterile 8 oz. mayonnaise jars with screw-caps, several sterile 20 c.c. screw-cap vials, sterile 10 c.c. pipettes, and a metal

insulated box in which samples could be kept under refrigeration. Four samples were taken from the container of bulk ice cream as follows:

The first from the surface with the vendor's scoop and placing the ice cream in a sterile jar labeled "Surface Vendor's Scoop"; the second from the surface with a sterile tablespoon and placing the ice cream in the sterile jar labeled "Surface Sterile Spoon"; the third with the vendor's scoop from the freshly exposed sub-surface after the surface had been removed by scraping with one sweep of a sterile spoon a layer of at least 1 inch in depth, labeled "Sub-Surface Scoop"; the fourth was also taken from the freshly exposed sub-surface area with a sterile spoon, care being exercised to avoid touching that portion of the ice cream from which the scoop sample had been removed, labeled "Sub-Surface Sterile Spoon."

A sample was also taken of the water in which the scoops or dippers were kept. Ten c.c. of this water were taken with a sterile pipette and placed in a sterile screw-cap vial.

The samples were carried in the refrigerated case containing ice or dry ice until the return to the laboratory. Upon arrival at the laboratory the ice creams and scoop water were plated. A few examples of the comparative counts will be noted in Table II.

In every instance the samples of ice cream taken with the vendor's scoop, regardless of whether it was from the surface or sub-surface, was higher than those taken with the sterile tablespoon, and in the majority of cases where the scoop water counts were high the samples taken by the scoop were also excessive, but the surface and sub-surface sterile spoon samples were low. Where the count of the scoop water was low the bacteria content of ice creams were found comparatively low and more consistent.

The above counts, typical of our findings, were based on the analysis of more than 200 samples, and we believe these results are conclusive evidence that the dipper or scoop is the major contributory factor in contamination of loose ice cream.

There are factors which influence the contamination of ice cream by utensils, making it necessary for the inspector to keep accurate reports of conditions found at the establishment during the time of sampling. For instance, the amount of ice cream in the can has a direct effect on the count, since the freshly opened can would not have been subjected to the high degree of scoop contamination as a nearly empty can. Also it was found that the time of day samples were taken influenced the count, due to the fact that dippers and containers were usually

TABLE II

Surface		*Sub-Surface*		
Vendor's Scoop	*Sterile Spoon*	*Vendor's Scoop*	*Sterile Spoon*	*Scoop Water*
135,000	34,000	143,000	2,000	6,336,000
61,000	10,000	38,000	4,000	3,760,000
21,000	3,000	11,000	1,000	215,000
50,000	20,000	12,000	5,000	192,000
256,000	39,000	320,000	12,000	384,000
198,000	35,000	43,000	27,000	576,000
640,000	69,000	91,000	9,000	448,000
5,000	1,000	3,000	1,000	6,000
30,000	11,000	24,000	20,000	4,000
110,000	31,000	254,000	21,000	1,344,000

washed in the morning just after the establishment was opened. Another factor was the physical condition of the scoops. Some were found to be broken and mended with pieces of cloth or string; some contained cheesy or slimy deposits, particularly around the gears and working parts, which clearly showed that they had not been disassembled for proper cleaning.

The data obtained from the inspectors' records showed that ice cream dippers, scoops, and other apparatus used in retail stores are generally kept in various types of vessels containing cold water. In some instances, particularly at soda fountains, the container has a constant stream of fresh water flowing in from the top. This type is no more satisfactory than the common vessel because the small stream of fresh water entering at the top is not sufficient in volume or in force to change more than the surface of the water, and leaves the heavier ice cream deposits in the bottom of the container. The scoops and containers are in most instances cleaned by scrubbing in hot soapy water once daily, usually in the morning, and in a short time, depending on the number of times the dippers are used, the water becomes fairly well loaded with ice cream, which soon reaches room temperature and becomes an ideal medium for the growth of bacteria.

Arrangements were made with several ice cream dispensing establishments to discontinue the use of the scoop containers, place their scoops and other dispensing utensils on dry racks, and rinse in either hot or cold running water before and after each use. Three or 4 days after the institution of this system, samples were obtained, the counts of which, as shown in Table III are considerably lower and more consistent than those taken with the wet scoops. It will also be noted that the samples taken with the sterile spoon from both the surface and sub-surface and samples taken with the scoop from the sub-surface are considerably lower. We attribute this to the fact that when the scoops are kept wet there is at each use a transfer of water of high bacterial count which penetrates the ice cream and carries the contamination to a depth of 2 or 3 inches.

TABLE III

Surface		*Sub-Surface*	
Vendor's Scoop	*Sterile Spoon*	*Vendor's Scoop*	*Sterile Spoon*
2,400	700	1,200	800
10,000	6,000	15,000	9,000
20,000	4,000	9,000	9,000
7,000	4,500	6,600	3,000
20,000	15,000	12,000	10,000
75,000	50,000	62,000	63,000
3,600	3,200	3,200	4,300
7,000	4,600	4,200	5,700
5,200	5,400	2,900	4,600
3,800	3,600	3,200	2,700
17,500	10,800	10,400	8,400
7,100	3,600	5,800	4,900

It seems reasonable to conclude that if the ice cream scoops and other dispensing utensils are kept on a dry rack protected from flies, dust, and other sources of contamination, instead of in water, and rinsed with either hot or cold tap water after and before each use, the amount of contamination from the dispensing utensils can be greatly reduced.

Effects of Inhalation of Smoke from Common Fuels

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FOR years the disease importance of smoke has been the center of long and repeated controversies. Yet the observations and conclusions drawn from these discussions have been more or less general, derived from inferential or purely speculative evidence. Thus, no reference is found in the literature regarding the direct effects of smoke arising from the burning of three commonly used fuels: anthracite, coke, and bituminous coal.

OUTLINE OF PROBLEM

The program in its entirety had as a primary object the determination of the maximum physiological and pathological effects of the mixtures supplied to experimental animals under specified conditions. Securing conclusive evidence in so broad a field requires time. Therefore the use of higher than normal concentrations of flue gases, and of combustion products mixed in definite proportions with air, supplied directly from furnace to gas-tight chambers containing animals, was deemed advisable. The solids and gases were thus in the same proportions, although not in the same concentrations, as those to which human beings are exposed.

In order to have interpretable effects, the animals were subjected to almost continuous exposure, the concentration of flue gases in the mixtures was uniformly maintained, and periodic analyses of conditions in the chambers and effects of the artificial atmosphere on the experimental animals were made.

EXPERIMENTAL SET-UP AND TECHNIC

Four gas-tight exposure chambers, capacity 60 cu. ft. each, were borrowed from the U. S. Bureau of Mines. In each of these were placed 4 rabbits and 8 rats. Seventeen days before the experiment ended 4 mice were added to each chamber. One of the chambers was used as a control, and each of the others was connected indirectly to a small egg stove. In other words, the three stoves burned respectively anthracite (nut), coke (domestic), and bituminous coal (about 35 per cent slack).

The amount of fuel burned per hour was the same in each of the stoves (1,000 grams). Fuel was charged at the beginning of each hour; at the half-hour the fire was stirred, and at the end of the hour the ash was shaken out. Fires were maintained in good condition, with the object of simulating fairly good household practice.

The animals breathed a mixture of air from a compressor line and gases from the appropriate stack, the stack gases

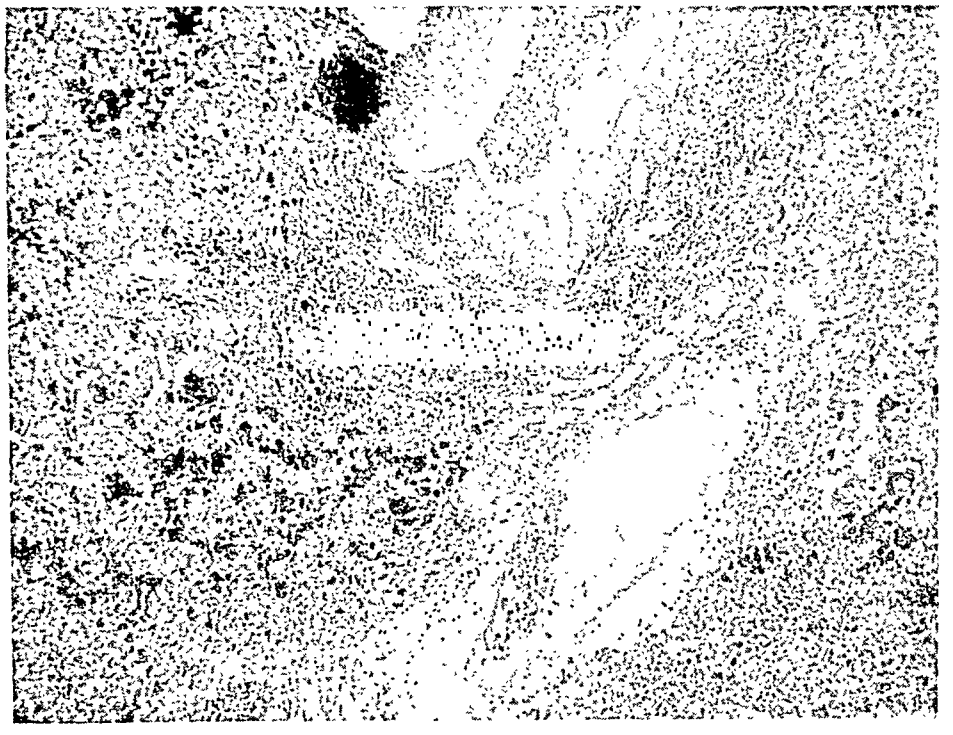


PLATE I—S–35–840. Lungs of rat 21 at the end of 80 days' exposure to bituminous coal. Acute purulent bronchitis; goblet cell degeneration; much pigment both extra and intracellularly. 150 X.

in such proportions that the concentration of sulphur dioxide and carbon dioxide would be below any percentage reported as toxic, carbon monoxide not more than a trace, and oxygen about 19 per cent. The air-gas mixture in each chamber was changed completely every 15 minutes. By means of injectors, the required amounts of gases were drawn from the stacks, mixed with air from a compressor line, and introduced into the chambers. The animals were exposed 23 hours a day for 80 days, and released from their cages for 1 hour each day. They were fed a standard balanced diet.

Fuels used and gases generated in each chamber were analyzed; dust counts, temperatures, and relative humidities were recorded; the animals were weighed and examined at frequent intervals; blood-counts were made, and the animals that died were autopsied. Immediately following the termination of exposure most of the remaining animals were killed and autopsied, a few being held for a longer period of time and chloroformed at various intervals, so that the development of possible further effects might be observed.

The following three tabulations summarize briefly the results of fuel and gas analyses and dust counts.*

TABLE I

Analysis of Fuel Used

Fuel	*Vol. Matter* *Per cent*	*Fixed Carbon* *Per cent*	*Ash* *Per cent*	*Sulphur* *Per cent*
Anthracite	3.45	91.10	5.45	0.58
Coke	2.61	85.93	11.46	0.92
Bit. coal	36.15	59.34	4.51	1.36
Bit. 3/8 Screen	33.19	58.61	8.20	1.53

* The chemical analyses and dust counts were made by M. A. Yavorsky.

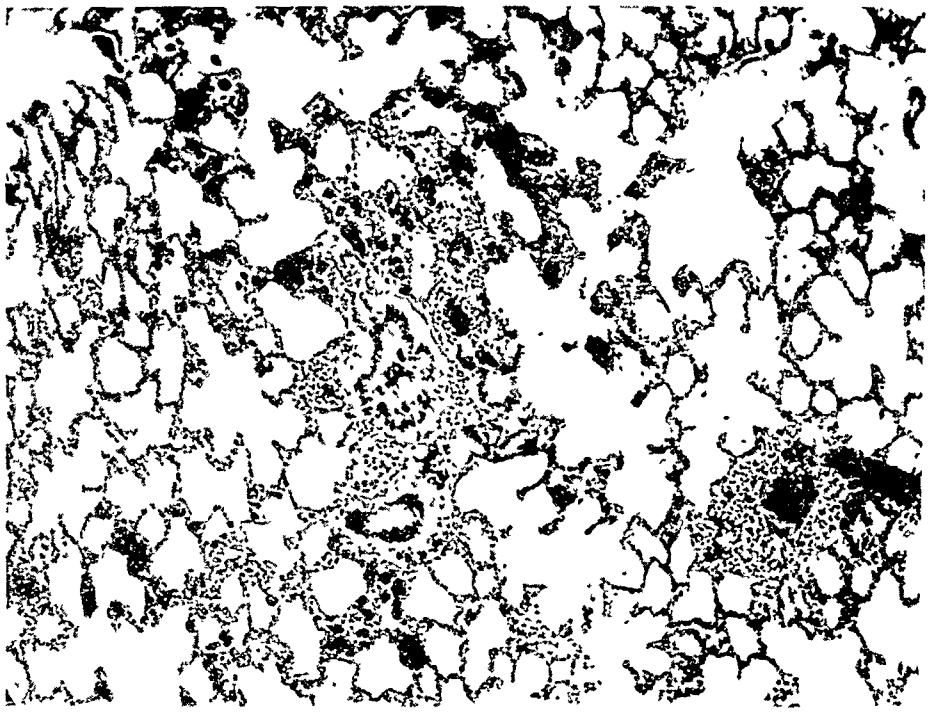


PLATE II—S-36-115 Lungs of rat 20, 103 days after exposure to bituminous coal had ceased. Carbon mostly intracellular and clustered within peri-vascular lymph spaces. Cells compressed and spingle-shaped. 150 X.

TABLE II

Analyses of Gas-Air Mixtures in Chambers *

		O_2 Per cent	CO †	CO_2 Per cent	H_2S ‡	SO_2** P.p.m.
Anthracite	Average	20.6	1	0.4	2	1.91[3]
	Maximum	21.0	D	0.7	N	3.68
	Minimum	19.5	o u b t f u l	0.1	o n e	0.48
Coke	Average	20.1		0.5	D	9.12
	Maximum	21.7		0.7	e t e c t a b l e	14.57
	Minimum	19.4	T r a c e s	0.3		5.84
Bit. coal	Average	20.0		0.6		7.51
	Maximum	20.8		10.0		13.63
	Minimum	19.2		0.2		3.33

* As determined by the following methods:
† Yant, W. P., and Sayers, R R *Pub Health Rep*, 37, 27-52-2434, 1922.
‡ Littlefield, J. B., Yant, W P., Berger, L B., U. S Bureau of Mines, *Rep. Invest.* 3276, June, 1935
** Smith, R B *J. Indust. Hyg.*, Dec, 1931

TABLE III

Dust Counts

(Particles per c.c.)

Chamber	*Average*	*Maximum*	*Minimum*
Control	125	221	38
Anthracite	312	806	48
Coke	370	911	108
Bit. coal	4,410	5,640	3,502

These counts represent averages of a number of samples taken during each quarter hour after firing, at intervals during the test period. Samples were taken with an Owens jet counter, the particle counts being made under a microscope at a magnification of 970 diameters.

EFFECTS ON WEIGHT OF ANIMALS

Table IV is self-explanatory. If the gain in weight of the control animals is considered as being 100 per cent, the rats in the anthracite and coke chambers gained 105 per cent and 114 per cent respectively, while those in the bituminous cage showed a gain of only 75 per cent. Among the rabbits, the animals subjected to anthracite gained 84 per cent; those exposed to coke gained 77 per cent; while the animals breathing a bituminous coal gas-air mixture showed a total gain of only 9 per cent. It is noteworthy that although one of the rabbits in this cage was in the growing stage of life, it actually weighed less at the end of the test period than at the beginning.

EFFECTS ON THE BLOOD

Due to lack of time, only the rabbits were used for blood studies. Three control blood counts and smears done on each of the 16 rabbits on 3 successive days immediately before exposure began, were found to be normal (Table V).

Following exposure, two complete counts on all animals were done at weekly intervals. Of the 4 groups, only the animals in the bituminous chamber showed an immediate response in the blood picture. Three of the 4 rabbits in this chamber showed a leucocytosis above 10,000 WBC per cu. mm. of blood when the first post-exposure count was done. Weekly or bi-weekly blood counts were therefore continued in this group until the cessation of exposure. Since none of the other animals showed any appreciable blood changes, counts on them were done only about every other week or less frequently.

HEMOGLOBIN AND ERYTHROCYTES

A gradual and consistent rise in the percentage of hemoglobin and number of erythrocytes per cu. mm. of blood was noted in all animals, including the controls; this was considered physio-

TABLE IV

Weight Gains of Experimental Animals

Av. Gains Bet. Dates Indicated	*Control*			*Anthracite*			*Coke*			*Bit. Coal*		
	M&F	*Male*	*Female*	*M&F*	*Male*	*Female*	*M&F*	*Male*	*Female*	*M&F*	*Male*	*Female*
Rats												
Gains in grams 8-2-35 to 11-11-35	90.7	108.6	77.5	95.4	123.6	67.3	103.7	111.7	93.1	68.0	78.4	60.2
Gains in per cent comp. to control rats	100	100	100	105.2	113.8	86.8	114.3	102.9	120.1	75 0	72.2	77.7
Rabbits												
Gains in grams 8-4-35 to 11-13-35	1,380	1,664	1,287	1,160	976	1,344	1,074	1,074		129	403	–145
Gains in per cent comp. to control rabbits	100	100	100	84.1	58.6	104.4	77.8	84.2		9.3	24.2	

Only those animals were considered that had lived through the entire period of exposure.

TABLE V

Group Average Blood Counts (preëxposure controls)

	Percentage Hemoglobin (Sahli)	*Red Blood Cells*	*White Blood Cells*	*Polymorphonuclears (100 cells counted)*	*Lymphocytes*	*Other Cells*
Control	65	5,417,000	5,750	21	71	8
Anthracite	65	5,210,000	5,697	18	74	8
Coke	62	5,245,000	6,066	19	70	11
Bituminous	63	5,566,000	6,025	21	70	9
Average for all cages	63.7	5,359,000	5,886	19	71	10

logical and attributed to increasing maturity. But in each set of animals a further increase in hemoglobin content was noted. Thus, the average per cent of hemoglobin for all the animals in the anthracite cage was slightly higher than that of the controls; that of the coke group higher than the anthracite group; and that of the bituminous animals still higher than any of the preceding groups. The red cell count in all but the bituminous group of animals was practically the same. It was in the animals exposed to bituminous coal that the greatest variations occurred, both the hemoglobin and red blood cells ascending rapidly in steep, roughly parallel curves.

In Table VI the average of all 4 animals in the bituminous chamber is shown (80 per cent hemoglobin and 6,580,000 RBC) but since 2 died soon after exposure, the average hemoglobin and red blood cells of the 2 remaining rabbits would seem more accurate (86 per cent hemoglobin and 6,790,000 RBC). Particularly striking are the counts in rabbit No. 11, one of the two survivors:

COUNTS OF RABBIT NO. 11

	Date	*Hemoglobin*	*Red Blood Cells*
Preëxposure average	7-18-35	64.3	5,523,000
Post-exposure	8- 6-35	76	6,790,000
	8-19	86	7,020,000
	8-28	92	7,340,000
	9- 4	98	7,460,000
	9- 9	95	7,430,000
	9-11	100	7,530,000
	9-17	108*	7,140,000
	9-30	99	7,720,000

* Error? All observations but this one were made by the same person.

At the end of the experiment this rabbit showed a 54.7 per cent increase in hemoglobin and a 39.7 per cent increase in red blood cells per cu. mm. of blood.

TABLE VI

Group Average Blood Counts During Exposure

	Percentage Hemoglobin (Sahli)	*Red Blood Cells*	*White Blood Cells*	*Polymorphonuclears (100 cells counted)*	*Lymphocytes*	*Other Cells*
Control	71	5,645,000	10,004	24	68	8
Anthracite	75	5,717,000	9,479	28	63	9
Coke	77	5,657,000	9,913	35	60	5
Bituminous	80	6,580,000	11,285	48	47	5
Average for all cages	77	5,952,000	10,261	34	58	8



PLATE III—Gross appearance of lungs of rabbit in bituminous cage 429 days after exposure ended.

WHITE BLOOD CELLS (TABLE VII)

All animals, including the controls, had a leucocytosis at some period or other during the course of the experiment. There was considerable individual variations in the white cell counts, but when averages were computed for each group of animals, those in the anthracite chamber had only a very slight increase in the number of white corpuscles, while the bituminous group had a definite, moderate leucocytosis. The coke group showed an increase both in total white cell count and polymorphonuclear count intermediate between the anthracite and bituminous animals.

PATHOLOGICAL EFFECTS

Eighty animals were autopsied; 9 died during exposure; 3 more died at varying intervals after exposure; 57 were killed immediately after the experiment; and 4 were killed 103 days later. The remaining 8 were held for longer observation and killed after 429 to 443 days.

PATHOLOGIC LESIONS IN ANIMALS WHICH DIED

The 2 mice in the control chamber died of bronchopneumonia. In 1 there were widespread complicating miliary

TABLE VII

Individual White Cell Counts During Exposure

	Control				*Anthracite*			
Rabbit No. →	*1* †	*2*	*3* ‡	*4*	*5*	*6*	*7*	*8*
1st count	6,300	7,650	7,850	7,700	7,500	6,200	7,950	6,250
Last count	10,150	7,700	12,500	12,650	9,200	10,500	13,000	9,000
Highest count	13,750	12,900	12,800	12,650	10,150	11,700	13,000	9,400
Average count	9,975	9,140	10,462	9,640	9,640	9,490	10,310	8,400
Group Average		10,004				9,479		

	Bituminous				*Coke*			
Rabbit No. →	*9* *	*10*	*11*	*12* *	*13* †	*14*	*15*	*16*
1st count	9,950	10,900	10,300	10,650	8,000	7,600	7,300	7,650
Last count	12,100	15,500	11,200		11,500	13,150	9,600	10,850
Highest count	12,100	16,650	13,350		14,200	13,150	10,800	11,600
Average count	10,275	12,830	11,380		10,330	9,710	9,500	9,913
Group Average		11,285				9,913		
Average for surviving 2		12,107						

* Died during exposure (pneumonia).
† Died after exposure (intestinal parasites) 3% eosinophilia.
‡ Died after exposure (fibrinous pleuritis and bronchopneumonia).

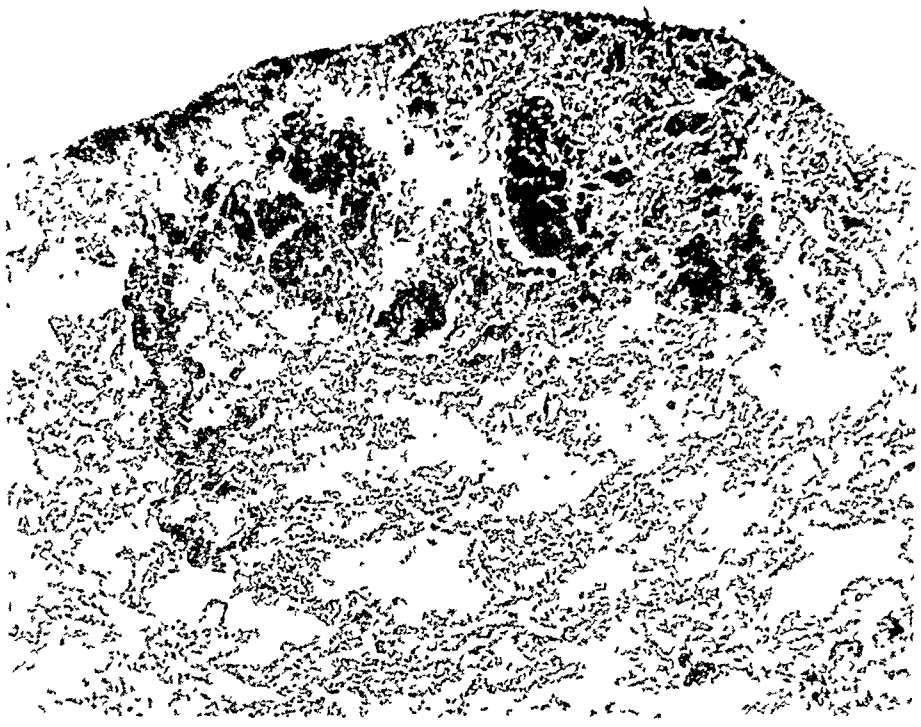


PLATE IV—S-36-1043 Microscopic appearance of lungs of same animal Carbon pigment phagocytes compressed and elongated into spindle-shapes 300 X.

abscesses of the liver, spleen, and kidneys. The pneumonic process was possibly a terminal one and associated with a parasitic infection. During the entire span of exposure in the anthracite group of animals, no deaths occurred. Two rabbits and 1 rat from the bituminous group died of confluent bronchopneumonia. The involvement in all was massive, contrasting strongly with the early, sharply limited inflammatory patches seen in the other groups. All of the animals which died in this chamber had acute bronchitis, and all showed marked pigmentation although death occurred after intervals of only 14, 21, and 40 days, respectively. In the animals exposed to coke, bronchopneumonia was the cause of death of 1 rat and 3 mice—the mice succumbing at the end of 2 weeks, while the rat died after 55 days. One of the mice also had necrosis with numerous parasitic cysts of the liver. No bronchitis was seen in this group.

Three rabbits died after exposure had ceased. One, a control animal, died after 43 days. Its lungs were essentially free from lesions, and contained only a rare carbon pigment phagocyte. Death was due to abdominal parasites, the entire mesentery being studded with opaque, encysted forms. Another death, also due to abdominal parasites, occurred in the coke cage 139 days after the end of the experiment. There was moderate carbon pigment phagocytosis. Except for edema there was no pulmonary involvement. The third rabbit, another control, succumbed to fibrinous pleuritis and bronchopneumonia 301 days after exposure. An occasional carbon-bearing phagocyte was found in its lungs.

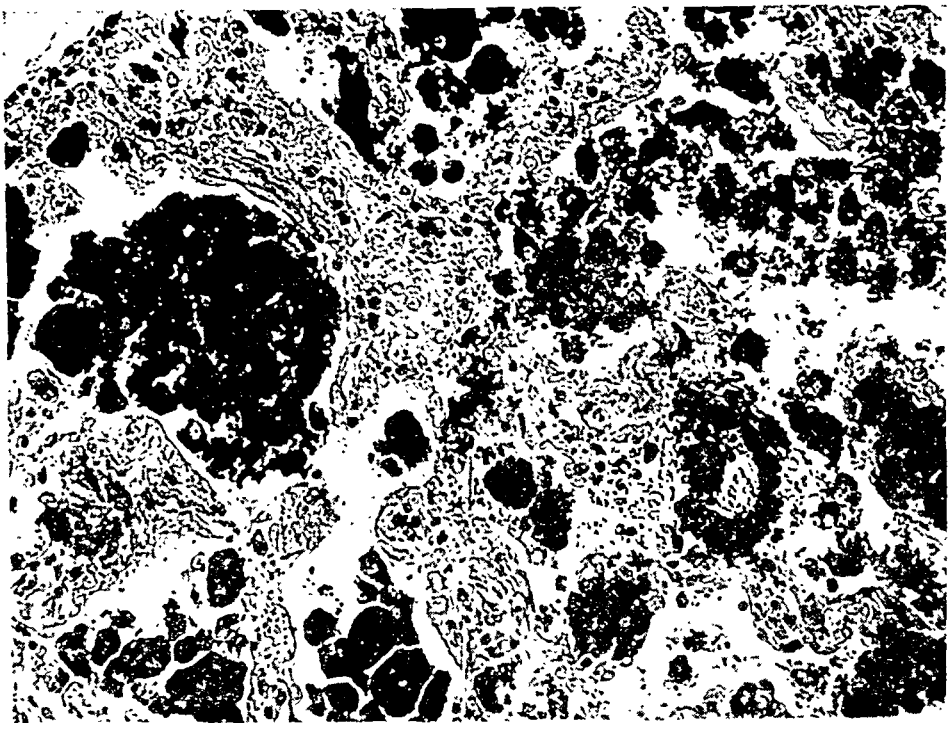


PLATE V—Another section of the same lungs (Plate IV) showing collagen. Mallory stain. 400 X.

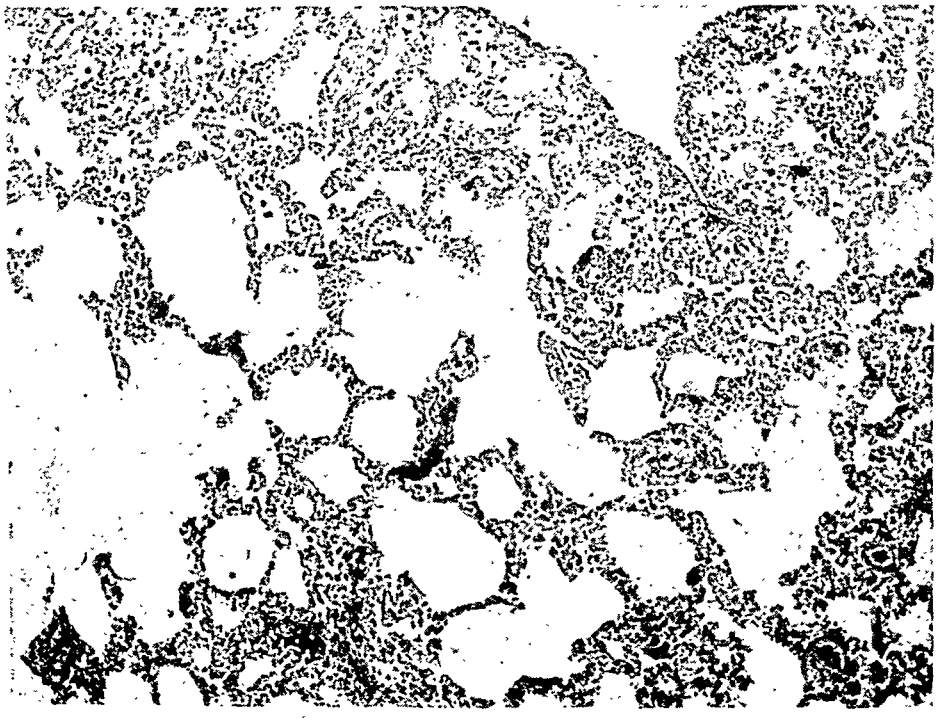


PLATE VI—S–36–1034. Lungs of rabbit in coke cage, 440 days after the end of exposure. Moderate pigmentation. No fibrosis. 175 X.

PATHOLOGICAL FINDINGS IN ANIMALS KILLED IMMEDIATELY AFTER CESSATION OF EXPOSURE

Two mice, 6 or more rats, and 2 rabbits from each chamber were chloroformed as soon as exposure ceased.

Due to their susceptibility to parasitic infections, the mice were unsatisfactory for our purpose. Five of the 8 had cysts or miliary abscesses of the liver. Yet in general, the amount of pigment seen in their lungs after only 17 days' exposure paralleled that found in animals exposed for longer periods of time; *i.e.*, an occasional carbon bearing phagocyte was seen even in the control animals which were breathing only pure, filtered air; very little more pigmentation was present in the animals exposed to anthracite; moderate deposits were found in those exposed to coke, while massive accumulations were invariably present in the group of animals exposed to bituminous coal.

Several rats which were born during the course of the experiment were removed from the cages at various intervals, but were not autopsied until the experiment was ended. None of them showed any significant pathological changes. The descriptions given below apply only to the animals which were on continuous exposure for the entire 80 days.

Many of the animals, irrespective of the type of exposure, showed some congestion of the lungs and patches of collapse or emphysema. Edema of the lungs was seen fairly frequently in all groups, but was, perhaps, most marked in the animals exposed to coke. No further mention will be made of these conditions except when particularly pronounced. Some of the animals showed evidence of increased goblet cell

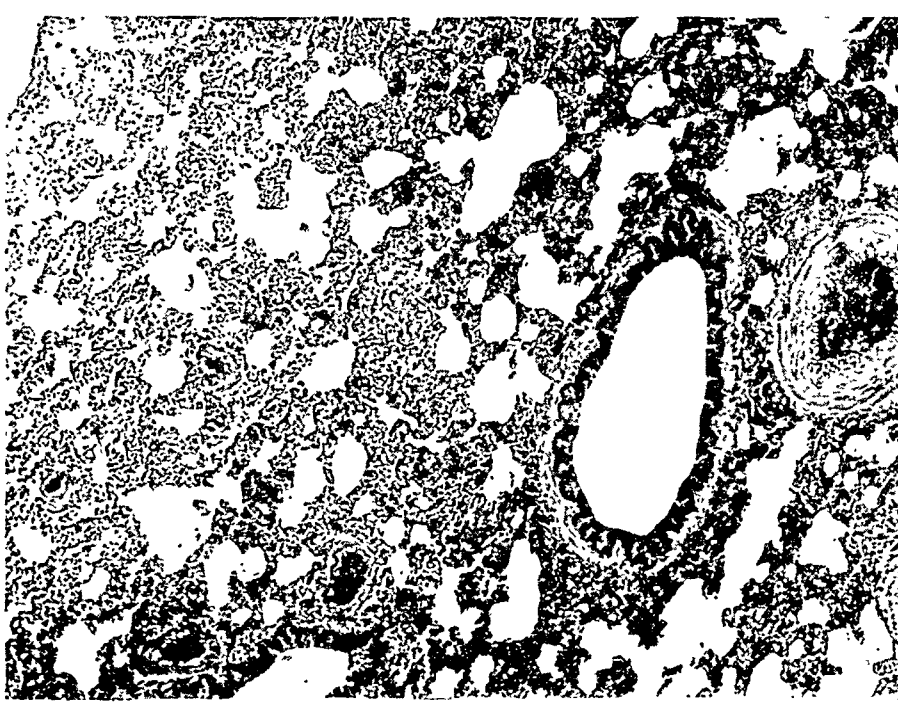


PLATE VII—S-35-883. Lungs of rat 70 at the end of 80 days' exposure to anthracite. No carbon pigment phagocytosis. 150 X.

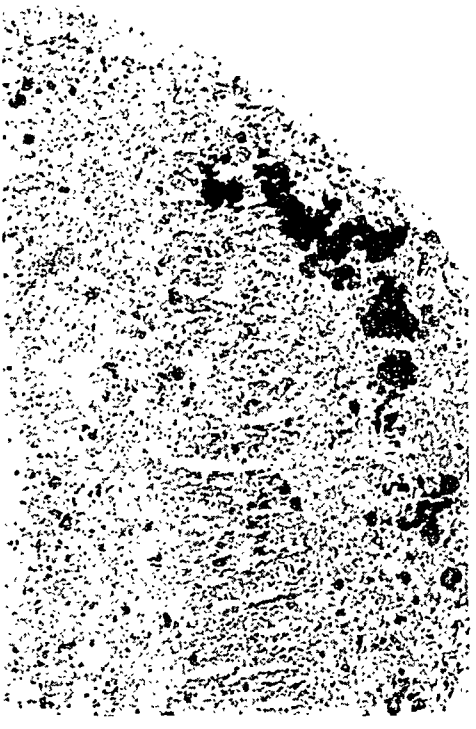


PLATE VIII — S–35–874. Peri-bronchial lymph node of rat 17 at the end of 80 days' exposure to bituminous coal. Large masses of carbon pigment both intra- and extracellularly. 16 X.



PLATE IX — S–36–1043. Peri-bronchial lymph node of rabbit in bituminous cage 429 days after exposure ended. Carbon concentrated in foreign body giant cell granuloma. 16 X.

activity, but this was neither sufficiently marked, nor sufficiently consistent to be conclusive. In the brief descriptions which follow, therefore, only the quantity and location of carbon pigment and the presence of purulent bronchitis and bronchopneumonia will be stressed while other pathological changes will be mentioned only *en passant*.

Sections of liver and spleen from each animal were carefully examined for carbon pigment phagocytosis. Many of these sections showed phagocytes loaded with black granules morphologically indistinguishable from carbon. All questionable sections were treated by a modified Perle method and reëxamined. None showed any phagocytosis of carbon. Neither was any carbon seen in the sections of nasal septum and bone marrow many of which were examined.

CONTROL ANIMALS

A very early bronchopneumonia and numerous miliary abscesses of the liver were the pathological findings in one mouse.

Among the rats, one showed a slight bronchitis; another had a tumor of the bronchi, in no way related to the experiment, and an associated bronchopneumonia.

Both rabbits showed some evidence of increased bronchial goblet cell activity.

Phagocytosis of carbon pigment in all of the animals was either absent or very slight.

ANIMALS IN ANTHRACITE CHAMBER

With the exception of 2 rats which showed patches of bronchopneumonia, none of the animals seemed in any way affected. Phagocytosis of carbon pigment in the lungs of the animals in this chamber was scarcely more marked than in those of the control chamber.

ANIMALS IN BITUMINOUS CHAMBER

One mouse had an acute purulent bronchitis and bronchopneumonia. There were no associated pathological changes in the liver.

While no pneumonia was found in any of the rats, 5 of the 6 showed evidence of acute purulent bronchitis. Two showed definite hyperplasia of the bronchial epithelium, with peri-bronchial lymphoid hyperplasia.

Only 1 of the 2 surviving rabbits in this chamber was killed at this time. Autopsy revealed a frank bronchopneumonia.

In all animals in the bituminous cage pigmentation of the lungs and peribronchial lymph nodes was intense. Both the gross specimens and the microscopic sections of these animals stood out boldly and could be differentiated at a glance from the tissues of the animals in the other 3 groups. Under the microscope the carbon was found to be both intra- and extra-cellular. The carbon-bearing phagocytes were crammed with pigment to the point of over-spilling; yet burdened as these cells were, they were evidently capable of considerable motility since many had migrated into the alveoli, bronchi, the

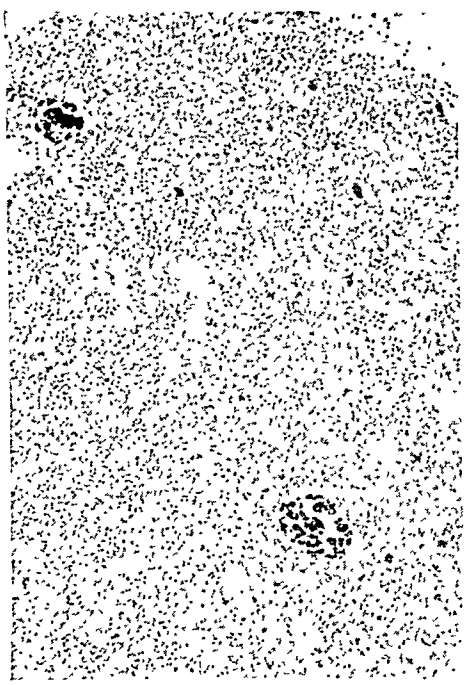


PLATE X—S–36–1034. Peri-bronchial lymph node of rabbit in coke cage, 440 days after the end of exposure. Moderate pigmentation. 16 X.

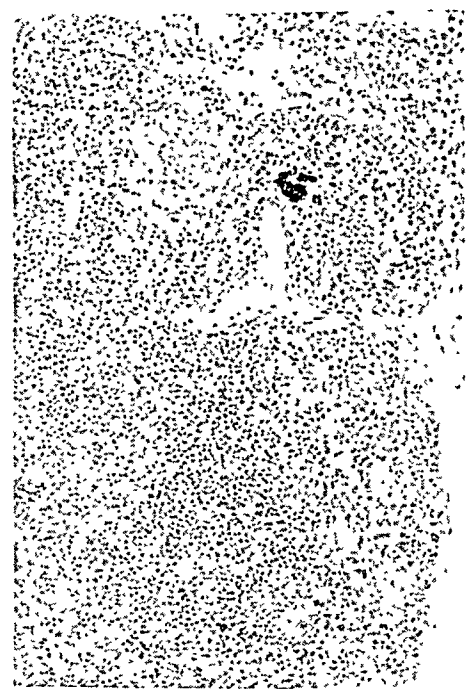


PLATE XI — S–36–1103. Peri-bronchial lymph nodes of rabbit in anthracite cage 436 days after exposure ended. Slight carbon pigment phagocytosis. 16 X.

inter-alveolar septa, the peri-bronchial and peri-vascular lymphatics, and finally into the peri-bronchial lymph nodes. In only 1 animal was there any extra-pulmonary transportation of pigment—a rat showing moderate carbon-cell invasion of the peri-pancreatic lymph node.

ANIMALS IN COKE CHAMBER

A parasitic infection (filariasis) with hemorrhage of the lung and multiple abscesses of the liver was found in a mouse; a rat had bronchopneumonia with acute and chronic bronchitis; both rabbits showed marked, diffuse edema of the lungs. Pigment phagocytosis was slight or moderate and most frequently seen in the peri-vascular lymphatics.

PATHOLOGIC EFFECTS IN ANIMALS KILLED 103 DAYS AFTER EXPOSURE

Four rats, 1 from each chamber, were chloroformed 103 days after cessation of exposure, in order to determine whether any fibrosis had yet occurred.

Of the 4 animals only the control rat had an acute bronchitis and bronchopneumonia. The other 3 showed no remarkable pathologic reactions. Peculiarly enough, pigmentation in the control animal, while only moderate, was slightly more apparent than in the animal exposed to anthracite. The lungs and peri-bronchial lymph nodes of the rat from the bituminous chamber were deeply pigmented. Practically all of the carbon was intra-cellular and practically all carbon-laden phagocytes were clustered within the peri-vascular lymphatics. It was in this animal that the first signs of fibrosis were noted. Some of the pigment bearing cells were definitely compressed and spindle-shaped—unmistakable evidence of early fibrous proliferation in the lungs. While carbon was deposited in moderately heavy quantities in the lungs of the rat exposed to coke, there was no suggestion of fibrosis.

PATHOLOGIC EFFECTS IN ANIMALS KILLED ABOUT 14 MONTHS AFTER EXPOSURE

In order to determine what pathological reactions had resulted in a still longer period of time (about 14 months later) it was decided to chloroform the surviving 8 animals: 1 control rat, 1 rat and 2 rabbits in the anthracite chamber, and 1 rat and 1 rabbit in each of the other two cages.

Neither the control nor the animals in the anthracite chamber showed noteworthy findings. The lungs and peri-bronchial lymph nodes of these 4 animals were but scantily pigmented. The reactions in the 2 animals exposed to bituminous coal were essentially the same as those found in the animals killed at an earlier date—*i.e.*, both the rat and the rabbit showed marked proliferation of the bronchial epithelium and marked peri-bronchial lymphoid hyperplasia. (It should be noted, however, that the latter finding was also present in many of the other animals, although perhaps not to such a marked degree.) Multiple abscesses of the lungs and acute purulent bronchitis were seen in the rat. Of great interest was the quantity and distribution of pigment in these 2 animals. Some of the carbon was still unphagocyted, but by far the greater part was contained within cells some of which had become elongated and compressed into spindled shapes. Considerably more pigment was found lodged in the peri-bronchial lymph nodes of these animals than in those formerly killed; furthermore, it was no longer diffusely distributed throughout the gland but was concentrated in huge foreign-body giant cells.

Of the 2 animals exposed to coke, 1 was essentially free from pathological changes while the other had a widespread infection suggestive of some fungus invasion. As in the case of the mouse which had a filaria infection, so, in this animal, there was an associated

bronchopneumonia. Pigmentation of the lungs and peri-bronchial lymph nodes was not marked.

SUMMARY AND CONCLUSIONS

The conclusions that may be drawn from this experiment must necessarily be limited because the equipment was imperfect, the animals were too few, and the time was short. Nevertheless, certain observations appeared to be constant for each of 3 respective groups of animals subjected for the same length of time, under comparable conditions, to the same concentrations of combustion products of anthracite, bituminous coal, and coke. A fourth series of animals placed in purified air constituted the control group.

1. Considering the weight gain of the control animals as 100 per cent, the anthracite rats gained 105 per cent, the coke animals gained 114 per cent, and the bituminous group 75 per cent; among rabbits, the anthracite gain was 84 per cent, coke 77 per cent, and bituminous coal 9 per cent.

2. The percentage of hemoglobin and the number of red and white blood cells per cu. mm. of blood rose consistently in all groups of animals, but this rise was least noticeable in the anthracite rabbits. The most immediate and pronounced blood changes occurred in the direction of leucocytosis, hemoglobin, and erythrocytic increase in the animals subjected to bituminous coal. Intermediate deviations were seen in the coke group.

3. Phagocytosis of carbon pigment in the lungs of the control animals was scarcely seen. It was slight in the animals exposed to anthracite, more obvious in those of the coke chamber, and very marked in those subjected to bituminous coal smoke.

4. The greatest number of uncomplicated pneumonias, and the greatest incidence of bronchitis occurred among the animals exposed to the products of combustion of bituminous coal.

5. Not even the faintest suggestion of fibrosis of the lungs was seen in the control animals or those exposed to anthracite or coke. In the lungs of animals exposed to bituminous coal, spindling of carbon-laden cells—apparently the earliest stage of fibrosis—was noted. It seems likely that soft coal, even when unaccompanied by other dusts, is capable of producing fibrosis if exposure is sufficiently prolonged.

6. The above results apparently justify further and more complete studies along the same line.

NOTE: The author acknowledges the assistance of Dr. S. R. Haythorn of the William H. Singer Memorial Research Laboratory and H. B. Meller, Head, Air Pollution Investigation, Mellon Institute.

Are Post-Mortem Statistics on Trichinosis Valid for the Living Population?

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THE number of all clinical cases of trichinosis reported in the United States from 1842 to 1936, is 4,543,[1, 2] This number is in striking contrast to the findings in autopsies reported from various parts of the United States. Since 1891 to the present time, systematic surveys for *Trichinella spiralis* on 2,065 autopsies have shown 234 positives, or 11.34 per cent.

One might be inclined to apply this percentage to the living population—that is, 14,742,000 persons (11.34 per cent of 130,000,000) infected with trichinella. This figure stands in such sharp contrast to the 4,543 reported cases that an explanation must be sought. There are either many millions of unrecognized cases of trichinosis in the United States, or the post-mortem statistics cannot be applied to the living population. Such application is not justified unless the incidence is verified for the living, even if the figures were statistically large enough and the autopsy material representative of a true cross-section of the population. In malaria or hookworm disease, the incidence at autopsy is much less than that in the living. On the other hand, the incidence of infection with tubercle bacillus in the living is the same as that at autopsy, as shown by diagnostic methods, especially the tuberculin skin test.

To test this question when applied to trichinosis, a simultaneous examination was made in autopsies and in living individuals in the New Orleans area, both groups being taken from nearly the same cross-section of the population.

To obtain the incidence in autopsies, 200 cases were examined by both the compressor and the digestion methods. Small pieces of diaphragm and pectoral muscle were compressed and examined, while a larger amount was ground up and digested by artificial gastric juice. Hinman,[3] in 1936, examined 200 bodies at autopsy from the Charity Hospital in New Orleans and found 3.5 per cent trichinous. The writer examined 200 cases from the Touro Infirmary and the Charity Hospital,* using 50 gm. of diaphragm and 10 gm. of pectoral muscle—a larger amount than Hinman used—and found 10 positive (4 white males, 2 white females, 3 colored males and 1 colored female), or 5 per cent.

The incidence in the living population was determined by means of Bachman's skin test.[4] The antigen was

* Aided by a grant from the Committee on Scientific Research of the American Medical Association.

TABLE I

	No. Cases Examined	Positive	Per cent Positive	Percentage Distribution by: Sex M.	Sex F.	Race W.	Race C.	Age in Years 0–19	20–39	40–59	60–79
Autopsies	200	10	5	5.8	3.7	7.1	3.4	0.0	3.3	4.9	10.0
Living Persons	200	10	5	7.1	3.8	6.3	0.0	0.0	3.8	5.3	15.7

prepared by dissolving dried and powdered trichinella larvae in Coca's solution. One-tenth c.c. of a solution of 1 part trichinella powder to 5,000 parts Coca's solution was used to test patients of the Touro Infirmary and the Hutchinson Memorial Clinic of the Tulane Medical School.† The injection was intradermal, and the reaction was read after 15 minutes. Coca's solution alone was used as control. Ten of 200 patients, or 5 per cent, reacted positively for trichinosis—5 white males and 5 white females. Two other cases, under treatment for hay-fever and asthma, also gave positive control reactions.

There were no negroes among those reacting positively, though 43 of the 200 persons tested were negroes. The failure to find a positive reactor in negroes was probably due to the difficulty of seeing the reaction on colored skin. Had the intradermal reaction shown as many positive cases in the negro patients as necropsy technics revealed, the percentage of positive cases in the living population would have been higher than that found in post-mortem cases.

Table I shows the comparative figures based on these two methods:

Considering the small number of cases, it is not possible to make conclusive statements, but comparison of the findings in the 2 groups shows great similarity, even in the sub-groups of sex, color, and age. It is suggested that the post-mortem findings in trichinosis may be representative for the living population. None of the individuals studied in either series gave a clinical history of trichinosis. It is believed that a large proportion of the positive cases is so lightly infected as not to show clinical evidence of the infection, thus explaining the discrepancy between reported cases and autopsy findings.

†The writer wishes to express his appreciation for the kind coöperation of Dr. Rigney D'Aunoy, Pathologist, Charity Hospital; Dr. John A. Lanford, Pathologist, Touro Infirmary; Dr. I. I. Lemann and Dr. D. N. Silverman, Touro Infirmary; and Dr. H. H. Russell, Hutchinson Memorial Clinic.

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An Outbreak of Typhoid Fever in Grand Rapids, Mich.

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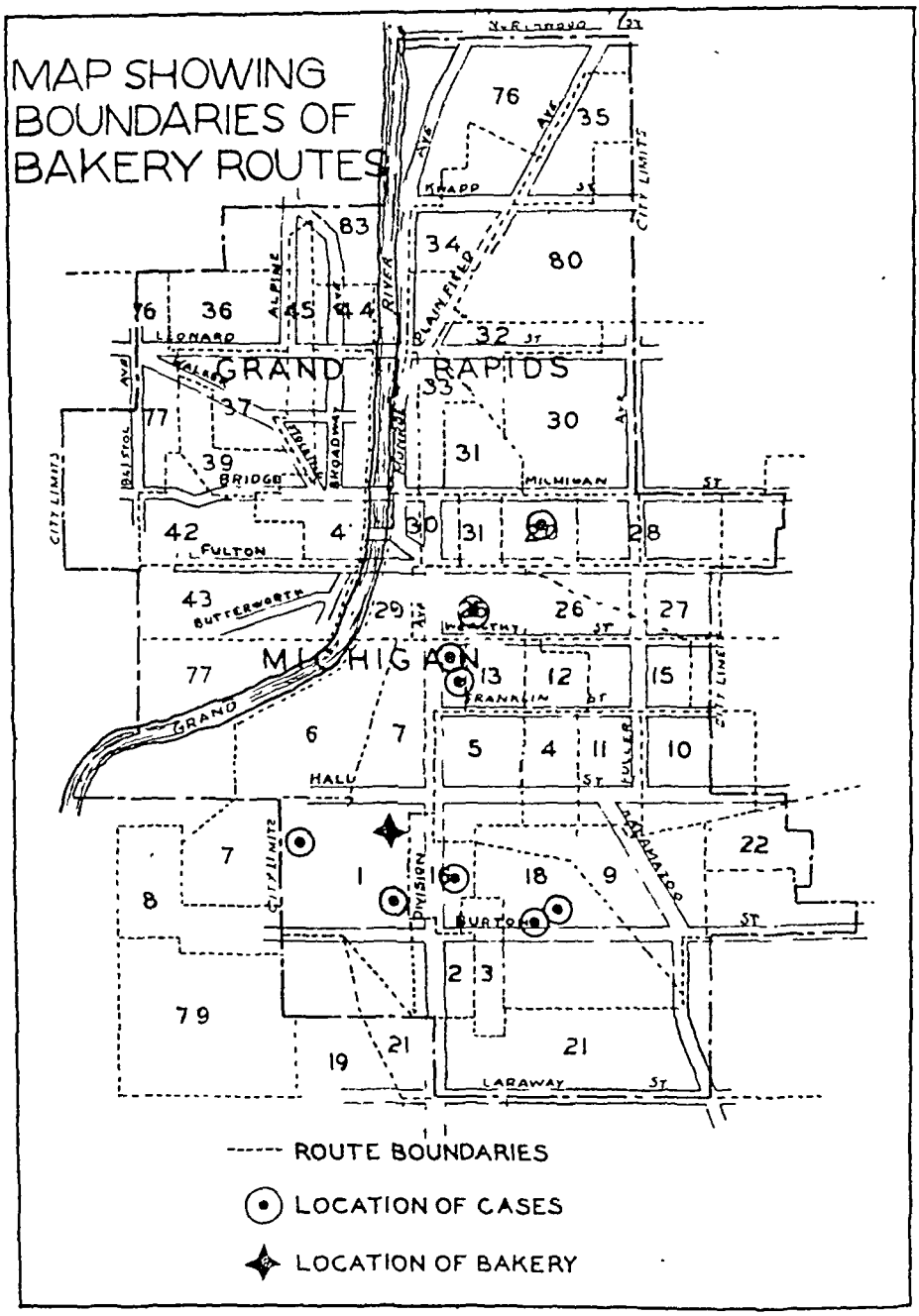
WHEN, on December 9, a case of typhoid fever was reported to this department, it occasioned no distinct alarm or apprehension even though this city has been remarkably free from typhoid fever for the past 5 or 6 years. When later in the day another case was reported of an individual living in the same neighborhood, still no unusual alarm was experienced. When, on December 11, however, another case was reported, followed by still another on the 16th, the department began to take an active interest in the situation. These 4 cases were followed by others, until a total of 9 altogether were reported to this department, the last one having been reported on January 4, 1937. During this interval it was noticed that 4 additional cases were reported in the nearby territory of the county.

The usual epidemiological procedures were started and brought out some interesting facts. The first 2 cases reported received their milk supply from the "S" dairy; the next 2 cases to be reported obtained their milk supply from the "G.R.C." dairy and the 5th case bought his milk from a neighborhood store. The 6th case obtained milk from the "L" dairy and the 7th from the "L.P." dairy; the 8th from the "B" dairy; and the 9th from the "S" dairy, the same as cases Nos. 1 and 2. All of these dairies are pasteurizing milk plants and distributed no raw milk whatsoever. All of these dairies were investigated thoroughly; stool specimens were taken on individuals who were at all suspicious, all of which were negative. Pasteurization methods were checked closely and found to be satisfactory.

The water supply at this time was also checked very thoroughly, particularly as an early spot map showed evidence that the water supply of the first 5 cases came from the same lateral. Case 6, however, was located in the southwest section of the city, the water supply of which came from an entirely different source of supply after leaving the filtration plant. The water supply was found to be entirely safe and it showed sufficient chlorine with no *B. coli* for many months previous.

Stool specimens from the contacts of every one of these cases were all negative, 3 specimens from each contact having been examined. The history of each individual was checked closely to determine whether or not he or she had been out of the city and had drunk any water or milk at that time. Only 1 patient gave a history of having been out of the city during the period of incubation. The water supply at the place where this patient had visited was checked and was found to be uncontaminated.

Up till the time of the reporting of the 7th case the department was puz-



zled as to the origin of the outbreak, inasmuch as the milk and water supplies were found to be safe and uncontaminated, and we were unable to locate any carrier from contacts. It was realized that the occurrence of 6 or 7 cases within a period of 2 weeks must be based on some common vector or focus of origin because, as has been mentioned before, this city has been remarkably free from typhoid fever for the past 5 or 6 years.

Due to the perseverance of John Soet, the sanitary officer, a re-check was made of these cases several times. After persistent questioning he finally found that all of the cases had been procuring their baked goods from the same bakery. Further inquiry elicited the information that all the cases had eaten cream puffs from this bakery. Suspicion at once was directed toward this food industry, inasmuch as this was the only common point of food supply. The question of fresh vegetables from peddlers was gone into extensively but was discarded when no positive evidence could be obtained.

The employees of this bakery, some 231, were all examined immediately, particularly with reference to past history of typhoid; 3 stool cultures were obtained from each employee; and an extensive survey was made of the bakery itself. Following the preliminary examination and survey of the sanitary methods, the number of employees under suspicion was limited to those who were employed in making ices, custards, and cream puffs, and to those who handled the bread after it came from the oven and before it was wrapped. Stool cultures were obtained from this group daily, but examination showed negative results for the first week. Finally on the 7th day a positive culture was obtained from an individual who was employed in the filling of cream puff shells with custard and whipped cream. Suspicion had cen-

Case	Age	Sex	Onset	Disposition	Specimen B	Specimen W	Specimen F	Specimen U	Specimen Bile	Milk Supply	Water Supply	Contacts
B. D.	8	M	11-21-'36	Hospital	+	+	—	—	..	Neg.	Neg.	All neg.
F. T.	13	F	11-23-'36	Hospital	—	+	—	—	..	Neg.	Neg.	All neg.
G. R. K.	26	F	11-23-'36	Hospital	—	+	—		..	Neg.	Neg.	All neg.
L. A.	48	M	11-28-'36	Hospital	+	+	—	—	..	Neg.	Neg.	All neg.
E. W.	20	M	11-30-'36	Home	—	+	—		..	Neg.	Neg.	All neg.
R. K.	19	M	12- 4-'36	Home	+	+	—	—	..	Neg.	Neg.	All neg.
F. E. G.	31	M	12- 6-'36	Hospital	—	+	—		..	Neg.	Neg.	All neg.
S. P.	50	F	12- 7-'36	Hospital	+	+	—	—	..	Neg.	Neg.	All neg.
W. W.	11	M	12-30-'36	Home	+	+	—		..	Neg.	Neg.	All neg.

Grand Rapids Health Dep't

tered on this part of the industry early, and production had been curtailed even before the finding of the carrier.

The first positive culture on the carrier was obtained January 18. The carrier, of course, was at once taken out of employment and placed under the supervision of this department. The last case in this outbreak was reported on January 4, 1937, the onset of which was December 30, 1936. The incubation period in this entire outbreak, based on clinical evidence, must have been between November 21 and December 31, 1936. The carrier is evidently of the sporadic type as the organisms are not found to be present in the stool continuously. She has been in the employ of the bakery since May, 1936; she has nothing significant in her past history, and the family history is negative as regards typhoid fever attacks.

Two cases in the county, which occurred at the same time as those in the city, were investigated, and it was found that both of these cases had also procured their bakery goods, including cream puffs, from the same bakery.

Further investigation at the bakery disclosed that their icings were not boiled but mixed without heating and then applied to cake, cream puffs, and other products. The custards and whipped cream are made largely from condensed and powdered milk. The statement was made that the custards were boiled but it is entirely possible that, in treating large amounts of this product, the innermost parts may not have been subjected to boiling temperature, or the product may have been contaminated by the carrier in the process of filling, which is more than logical. These cream puff shells are baked first and the filling is introduced into them from a large bag, but there is a great deal of chance of contamination when the tops of these shells are closed.

It was almost inevitable that this bakery was the source of infection of the outbreak inasmuch as all of the individuals procured their bakery goods from the same bakery; also the fact that no more cases were reported following the cessation of the production of cream puffs, was a significant factor, and the finding of the carrier, of course, clinched the epidemiological evidence in this outbreak.

This bakery supplies upward of 8,000 customers in the City of Grand Rapids and the surrounding metropolitan area in the county. It also supplies baked goods to several towns in the area of 50 to 60 miles from Grand Rapids. At least 1 case of typhoid fever has been reported in a town 21 miles from here, which gives a history of having eaten cream puffs from this same bakery.

Changing Public Health Practices and Problems*

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WITHIN the last 2 weeks an important professional group in the United States attempted to formulate certain primary principles regarding the development of a national health program. As its major bases it assumed that (1) the health of the people is a direct concern of government and a national public health policy directed toward all groups of the population should be formulated; (2) adequate medical care is an essential element of public health and local, state, and federal governments need to supplement present efforts of the medical profession to provide it; and (3) the problem of economic need and the problem of providing adequate medical care are not identical and may require different approaches for their solution.

The crystallization of the recognition of these principles in 1937 is perhaps more important than the principles themselves, for after all they were succinctly summarized as far back as 1854 by Sir John Simon in the City of London Reports when he first recommended the creation of a national Ministry of Public Health, to care, as he put it, for "the physical necessities of human life." It is likewise no novelty to accept with increasing seriousness the old concept that the saving of lives or the postponement of death are the major purposes of health work. When we couple with these objectives the maintenance or elevation of physical and mental efficiency, we have established for the present at least the basic goals of public health service. The definition of these services, the evaluation of technics for accomplishing and providing them, and the criteria of progress in accomplishment, are again subject matters which have long held the attention of the public health profession.

What is important in the pronouncement of the principles noted above, is that the time has apparently arrived for a universal agreement upon objectives, tacitly accepted by some and publicly rejected by others in past years. Let us discuss, for a moment, their implications for public health practice.

In less than 100 years the expectation of life at birth has increased from 35 to between 60 and 65 years in the United States. The major part of this increase in expectancy has been accomplished largely in the control and reduction in communicable diseases.

Concurrently with this change, profound changes in population distribution, both as to age and as to numbers, have taken place. The leading causes of death have in less than a

* Read before the Annual Conference of Health Officers & Public Health Nurses, Saratoga Springs, N. Y., June 24, 1937.

quarter of a century shifted in major aspects.

That these changes should have reached a critical turning point in the last few years has been emphasized to a greater extent than ordinarily, largely because we have just passed through a depression and post-depression period. Striking prophecies as to the problems of public health of the future, however, antedated the depression. For example, in the evaluation of the Cattaraugus County Health Demonstration in 1931, Winslow pointed out with uncanny vision the following forerunners of the principles of 1937:

1. The one great outstanding lesson of the Cattaraugus County Health Demonstration is the urgent importance, the great difficulty, and the high cost of adequate health service for rural communities.
2. There is obviously but one way out of this difficulty—state aid.
3. Surely the most prosperous nation in the world's history must find a way to equalize the distribution of the fruits of medical and sanitary science through all its areas.

These conclusions were written before and not during one of the worst depression periods which this country has experienced. Strangely enough, the depression period, through the emphasis on the necessity of supplying adequate medical care for the indigent poor, has given the fillip to the crystallization of principles enunciated in the early part of this paper.

To put these principles into action, it is important to summarize the changes in concept regarding disease prevention which have occurred in the last 25 years and upon the basis of which future perspective and method must rest. Fortunately, within the past 2 years, critical analyses of these questions have been made on each level of government and by voluntary groups interested in the scientific methodology of disease prevention and the promotion of health. Selected examples of these recent investigations may elaborate certain of the problems of the future.

MINNESOTA

Within the past year the Minnesota State Planning Board, through a subcommittee on public health, has attempted an evaluation of its public health practices and an exposition of its public health program for the future. The findings of that committee in general terms are applicable to the problems elsewhere in the United States.

It places emphasis, first of all, upon the fact that the 7 leading causes of death in Minnesota today are, in the order of their quantitative importance:

1. Heart disease
2. Cancer
3. External causes
4. Cerebral hemorrhage
5. Pneumonia
6. Nephritis
7. Tuberculosis

The committee further emphasizes that these were not always the 7 leading causes of death as is illustrated in the tabulation listed in the report and reproduced in this paper as Table I.

The changes in causes of death have come about because of radical changes in the character of population. This in turn is the result of the fact that the group of communicable diseases which once took a heavy toll of life has now become of relatively slight importance. When to these diseases we add accomplishments in the reduction of smallpox, diphtheria, and typhoid fever, we find a population of a changing age composition that has escaped the hazards of infancy and contagious diseases, and has entered a period of life when it is confronted by hazards of a totally different character.

Of the 7 major causes of death, only 2, tuberculosis and pneumonia, are communicable in character and it is unfortunately true that of the entire

TABLE I

SEVEN LEADING CAUSES OF DEATH

(Report of Minnesota State Planning Board, December, 1936)

Rank	1910	1915	1920	1925	1930	1935
1	Tuberculosis	Heart Disease	Heart Disease	Heart Disease	Heart Disease	Heart Disease
2	Heart Disease	Tuberculosis	Cancer	Cancer	Cancer	Cancer
3	Pneumonia	Pneumonia	Tuberculosis	External Causes	External Causes	External Causes
4	External Causes	External Causes	Pneumonia	Pneumonia	Cerebral Hemorrhage	Cerebral Hemorrhage
5	Cancer	Cancer	External Causes	Cerebral Hemorrhage	Pneumonia	Pneumonia
6	Diarrheal Diseases of Children	Nephritis	Influenza	Nephritis	Nephritis	Nephritis
7	Nephritis	Cerebral Hemorrhage	Nephritis	Tuberculosis	Tuberculosis	Tuberculosis

group of leading causes of death only these 2 show a downward trend.

The remaining 5 present a public health problem radically different from those which the public health profession has attacked in the past. These causes are in the degenerative diseases group, comparable with the obsolescence and depreciation of physical equipment with which the engineer has been familiar for years. They do not lend themselves to the simple mass community attack so familiar in the sanitation field and to a lesser degree in the field of communicable disease control. Their very nature, however, makes them more amenable to preventive measures, wherever these are understood, and to alterations in the hygiene of the individual.

As the Minnesota report so strikingly concludes, the leading causes of death of today "represent the field of adult hygiene, a field of medicine the interest of which to both the individual and the state must be, for some time to come, a matter of increasing concern and importance."

MASSACHUSETTS

In the report of the Special Commission to Study and Investigate Public Health Laws and Policies of the Commonwealth of Massachusetts (December 2, 1936), the commission cautions the citizens of Massachusetts not to rest too easily upon the public health achievements of the past and the favorable conditions of the present. It, too, points with pride to the enviable records in the control of smallpox, typhoid fever, and diphtheria, in the remarkable reductions in tuberculosis and infant mortality, to the first state cancer and pneumonia programs, to an excellent syphilis control program, and to the very successful operations in the milk and water sanitation and sewage disposal fields.

Although the commission takes great pride in these achievements, it warns that the governmental structure upon which public health programs of the future are to be constructed must be adapted to the changing needs and problems of society.

In Massachusetts, as in Minnesota, strengthening of local public health administration with increasing influence of the state, both in administration and in financial responsibility, is suggested.

As in most other instances the commission takes great care to indicate that it is not opposed to the theory of the greatest possible degree of local autonomy, "but believes that in certain matters it must be amended lest

it fall into disrepute and disappear."

In Massachusetts, as elsewhere, renewed emphasis appears on the need for greater coördination of public health activities, voluntary and official, to avoid duplication and conflict.

A demand for increased professional ability of persons employed in public health work is given equal importance with the governmental structure under which they labor. In this precept the Massachusetts Commission's findings parallel those of other investigations.

As to the scope of proper public health activity it recognizes that "Within recent years there has been a progressive broadening of the scope of public health. It is equally apparent that with the changing social and economic structure it becomes impossible to define what should be the desirable limits of public health activity. It seems inevitable, however, that government will more and more render certain essential services, and it is therefore important that there should be a guiding philosophy as to the relationship between these personal services and the private practice of medicine."

MARYLAND

The Rockefeller Foundation has just completed for the State of Maryland a review of its public health administration, carried out under the general direction of a sub-committee of the Maryland State Planning Commission.

The purposes of this review were to assemble sufficient information to give a composite picture of the present status of state and county health administration in Maryland in its relation to government in general, to closely allied official agencies, and to nonofficial agencies engaged in rendering important health services. Preëminent in the findings are the emphases upon the necessity of trained and efficient personnel, upon the functional integration of the component parts of the state organization and of the local subdivisions thereof, upon the desirability of extensive service in health education, and upon the developments of comprehensive venereal disease and tuberculosis programs.

It emphasizes, as in Minnesota and in Massachusetts, the great importance of so integrating the public health activities of the state as to curtail and prevent the scattering through various state agencies of activities which by their nature should be functions of the health department.

So important did the investigators find the interrelation of public health activities with other governmental necessities and duties that they recommend strongly the creation of an experimental county undertaking, for the development of an integrated public administration unit, wherein the various services of government, such as public health, education, social welfare, economic welfare, etc., may be administered as interrelated members of a unified county program. Their recognition of the inter-competitive phases of public health activities with all the other demands upon government led to the desirability of developing such an experimental county administrative unit. One of the major needs in Maryland as elsewhere would appear to be a horizontal uplifting of these several services of government, rather than an undue emphasis on the vertical uplift of individual services. As the public health demands upon government funds increase, this integration of collateral governmental operations with public health activity will assume an increasingly important position. The development of such integration is strongly recommended in the Maryland report. It is an effort to anticipate the results of undue competition for public money and service rather than to pay at a later date the penalties of the failure to recognize their significance.

FEDERAL

The great impetus given to the public health movement by the financial aid included in the Social Security Act is best exemplified by the 6 point program of activity which Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service, has recently announced. On the federal level of government this program supports and parallels the thinking represented in the state surveys herein summarized. Dr. Parran proposes—

1. To finish the job of wiping out tuberculosis.
2. To wipe out the dread disease syphilis, "the end results of which crowd our jails, our poorhouses, and our insane asylums."
3. To make available to people everywhere facilities for the proper diagnosis and treatment of cancer, which in his opinion would reduce by 20 per cent the deaths from this disease.
4. To reduce the "disgracefully high" death rate of mothers in child birth and of babies in their first month of life.
5. To correct conditions resulting from improper diet.
6. To restore crippled children to lives of usefulness.

These objectives require high degrees of governmental coördination and integration, changing concepts and methods in the attack on disease and expanding horizons of operation.

VOLUNTARY ASSOCIATIONS

Without reviewing in detail the contributions of different voluntary groups, reference should be made to the studies by the Milbank Foundation under the late Dr. Sydenstricker; the recent publication of the New York Tuberculosis and Health Association, *Hospital Care for the Tuberculous in Metropolitan New York; American Medicine,* issued by the American Foundation; and the report, *Public Health and Social Problems in the United States of America,* sponsored by the Health Organization of the League of Nations and the U. S. Public Health Service.

The last report is particularly striking in its reflections on consolidation of federal health agencies, and on the relation of federal to state and local governments. It comments particularly upon the fact that the last National Board of Health in the United States created in 1879 was repealed in 1882.

The concluding observations of this commission of foreign experts sponsored by the League of Nations is of more than special interest to students of public health practice in the United States.

It is useful to emphasize the impression made upon the visiting European hygienist by the impact of this world which is so new to him. In the first place, he is astounded by its size and its diversity, its considerable resources, the habits, methods of work, and aspirations of its people. He is even more bewildered by its constitution, its administrative machinery, its varying laws, and the special powers of the individual states. He is amazed by the multiplicity and diversity of its medical, public health, and social problems, requiring for their solution varying methods and formulae adapted to the manifold needs of regions which differ so widely as regards climate, population, and natural and acquired resources.

Daring reforms were born of the economic depression. They form part of a broad program capable of neutralizing the effects of the depression and of preventing its return. They are bringing about a social evolution and, in some instances, an actual transformation of living and working conditions. Here again is a profoundly interesting field of study, always provided that the underlying causes of the action taken or proposed are understood. For, as in many countries, including those of Europe, new methods are being sought to insure to the

economically weaker classes of the population a greater measure of health and security by the improvement and more perfect adaptation of public health and social organization—including facilities as well as legislation—to the actual needs.

Here it is important to emphasize the efforts that are now being put forth, or which have already borne fruit, to promote the coördination of all the activities exerted on behalf of hygiene and health protection. Attempts to promote such coördination have been made in all countries; its value has been emphasized by commissions convened by the League of Nations, which have set out the ways and means of bringing it about. In the United States, such coördination is attempted at every level of government—federal, state, municipal, and rural. Its realization is all the more important, and even more difficult, because it is opposed by obstacles inherent in the national and state constitutions, which give the states and cities powers and privileges which they ardently desire to retain.

Strangely enough one of the important summaries of the changing aspects of public health activity during the past 10 years may be found in *Middletown in Transition*. In this volume the Lynds find "As in certain other phases of its life, Middletown's chief innovations in caring for health during this decade have come at the two ends of the economic scale: the important addition of the new hospital . . . during the boom years, and the extension of free health service to the needy under the impact of the depression."

They also sense one of the important disabilities which are beginning to arise in public health and other social activities from the fact that "The great majority of local social changes . . . are not locally generated but are diffused to Middletown, against the pressure of local inertia and resistance, from outside agencies." This tendency of human beings to resist change from external sources is emphasized by these two sociologists, who point out that people make small minimum adaptations by a process of "inching along" and not by heroic turnovers.

CONCLUSIONS

The investigations herein briefly reviewed may lead to generalizations which may be helpful in delineating the future programs of public health. Even at the risk of undue simplification, a statement of such generalizations should be provocative in discussion. They are as follows:

1. The field of public health activity is expanding. It may no longer be restricted to the simple list of communicable diseases prevented and of community sanitation.

2. The more familiar and older activities must continue with equal force to hold the gains which have already been made.

3. Causes of death less important a quarter of a century ago have now assumed the place of greatest prominence. They are the diseases of adult life, and represent the results of the impact of heredity, environment, and early experience, biological and otherwise, upon the individual. They require for control new technics, a wider base, more money, and more intensive activity on all fronts.

4. The maintenance and elevation of physical and mental efficiency must assume new importance in the public health field. The vast disability created by illness in the industrial and in the general population offers a tremendous field for future combined public and private service.

5. Increased facilities for hospitalization, dispensary service, nursing facilities, and medical care of all types are obvious requirements for the future.

6. These activities presuppose the development of professional services of an amount and of a quality not yet available. Facilities for training of personnel must be improved, extended, and maintained.

7. All these enterprises will require more money and hence a gradual extension of state and federal intrusion into the local public health field. With such intrusion the obvious advantages of higher levels of performance, of increasing standards of action, and of ex-

panding research will ensue. Jointly with these advantages, however, the ever present problems of integration with lower levels of government and of coördination of all levels of government will emerge with greater intensity. To these problems, all students of government must give serious and continuing thought. To steer between the Scylla of declining efficiency of and interest in local government operation and the Charybdis of throttling centralization offers the real challenge in the public health movement in the next 10 years. To meet the demands of an ever-expanding horizon an ever-expanding budget will be necessary. To obtain and use it successfully, will require a strict adherence to the age old axiom that government without understanding on the part of the people will fall of its own weight.

Local and central governments may be depended upon, with the continuing support and advice of voluntary groups, to develop the objectives of public health and the methodology of attaining these objectives, but their success must depend, particularly in the shifting and expanding zones of public health activity, upon public understanding and sympathy in the most remote hamlet as well as in the state and federal capitals. The practitioner in public health must add to his armamentarium of medical and public health science a new concept of governmental relations, in which local autonomy and interest are revived under the stimuli of intelligent state and federal agencies.

On this occasion and in New York State it may be particularly appropriate to close by referring to two paragraphs by a former Governor of New York, in his Foreword to *The Report on Public Health in New York State by the State Health Commission of 1931.* In them President (then Governor) Roosevelt summarized the future issues before the public health profession in the following terms:

> The first public health advances were made by doing things for people. Purify the city water supply and during the next few years the Albany typhoid rate drops from 90 to 9; pasteurize milk supplies and there is immediate decrease in infant mortality. In these typical details of mass public health, the work of our state and local administrations ranks high. The report of the Commission of 1931, however, may be contrasted with that of the Commission of 1913 not only by virtue of its greater emphasis upon better local health administration and the decentralizing of state health functions, but also by its clearly drawn picture of the transition of the public health movement from the single problem of attaining mass health to the double task of maintaining mass health and controlling preventable disease in the individual.
>
> This is a more difficult task than that of establishing wholesale preventive measures in which the people themselves are not required to take an initiative. It involves the fullest use of public health education, so that citizens may understand and coöperate with activities necessary for their own welfare. Important as are the laws which the Commission has recommended, of far greater importance is intelligent action on the part of the individual and of the community.

EDITORIAL SECTION

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AMERICAN MEDICINE

UNDER the title above, the American Foundation has painstakingly collected the opinion of 2,100 persons from all the states of the Union, involving a correspondence of some 5,000 letters to and from representative medical groups and individuals, including general practitioners, specialists, deans of medical schools, boards of medical licensure, hospital superintendents, medical educators, and a few whole-time health officers.

The task must have been a huge one. It has been well done, presenting as it does for the first time a comprehensive self appraisement by a great profession of its own successes, shortcomings, and needs. A valiant attempt has been made to give due weight to what seem preponderating opinions on various phases of the subject without slighting those of minor groups or outstanding individuals. Wisely, no definite conclusions or recommendations are made by the authors.

On the whole, the picture presented is a gloomy one, although expressed hope for better things serves in part to lift some of the feeling of discouragement and even despair on the part of a few correspondents. Many of them seem to stand too close to the picture of their individual surroundings to evaluate its true meaning. Only the marks of the brush and daubs of paint attract the eye and excite comment. Others fully grasp the meaning of the technical, social, and economic evolution of medicine and give logical and well thought out suggestions for making orderly, constructive progress along the road of benefit not only to the public weal, but to that of the profession itself.

It is not surprising that an undiscerning public in mental confusion should view modern medical practice as a sort of three-ring circus in which their attention is so constantly distracted from one innovation to another that they are unable to concentrate on any one outstanding feature. Older persons must often regret that they are no longer able to go to a "good doctor" whom they know personally and by reputation, whose head is supposed to contain all that

is really valuable in medical practice, and who makes it unnecessary for them to await the convenience of this or that alleged authority, usually recommended by friends, for the particular ailment from which relief is sought.

That those within and without the medical profession of this country believe that the conduct of medical practice is suffering from a number of serious and interrelated ailments must be given weighty consideration in any fruitful discussion of ways and means to treat them. A general attitude of *laissez-faire* and individual self complacency will be of no avail. Wrapping one's self in the Hippocratic toga of professional pride and declaring that medical practice is not a "commodity" to be bought and paid for sounds well, but is little more than a meaningless and outmoded gesture. Good medical service, whether rendered by groups or individuals, may be compared to a newly mined diamond whose covering of clay completely hides its real value except to a very few who judge by more than they can see on the surface. When, however, it is cut and polished, the component parts are eagerly sought by many who would not have stooped to pick up and examine what seemed to them an ordinary and unattractive pebble.

How long must the parrot-like cry of "state medicine," "organized medical profession," "personal relationship between physician and patient," act as a stumbling block to logical action for improving medical practice and creating a demand for that which is good? If by the first is meant retaining for pay by official health organizations the services of medical practitioners on full- or part-time, the task of King Canute in trying to hold back the waves of the sea was child's play compared with that which faces any individuals or group combating so-called "state medicine." It is here; is growing by leaps and bounds; it was and is an inevitable human need and so recognized the world over.

"Organized medicine" has never existed as a national or even state body except on paper. Experience has shown that the better type of physician cannot be organized except under the pressure of a great crisis, and usually one which threatens the public health.

Personal relationship between physician and patient is unquestionably of value, especially in the care of the neurotic without discoverable organic defects, who, in this country, constitutes a goodly proportion of paying private practice. Unfortunately, however, it is the chief stock in trade of the physician with the "perfect bedside manner," ornate offices and equipment, and little else; of all quacks, charlatans, and cultists, and licensed physicians who never should have been admitted to the practice of the profession.

To those who are addicted to crossword puzzles, the query of what constitutes "available medical service" and "competent medical service" continues to be intriguing. "Available" medical service would seem to be service which can be obtained when it is needed. "Adequate" medical service can never be defined except in individual cases and even then it is often difficult to obtain an expression of opinion from competent medical men as to whether a given service was adequate or inadequate. A little more common sense and less splitting of hairs on these moot subjects would seem to be highly desirable in the interest of progress. The very nature and inevitable termination of chronic disease, dissatisfaction with the treatment received, frequently with no justification, the human characteristics, especially marked among Americans, of willingness to take a chance and try anything once, are leading numberless real and imaginary sufferers to seek false gods. Thus we find the clear springs of

orthodox, scientific, medical practice daily becoming more befouled by the vile scum of quackery under whatever ridiculous Latin, Greek, or Biblical name it chooses to masquerade. The demand for services marketed by these cults is so insistent that it reaches the ears of politically minded legislators who act on a demand for legal recognition, not according to common sense or with regard for the public health, but purely on the basis of an estimate of votes, pro and con.

Year after year the more conservative states, usually those with well organized health departments, continue with more or less success to fight off the motley crowd of cultists who besiege legislative halls at every session. Other states yield to what seems the inevitable and continue to admit them to practice under the sweet sounding but undescriptive status of limited licensure, the limits being determined by the ingenuity and public influence of the licensee. At the present rate of admission to the practice of these cults in certain states, notably California, there will soon be little or no place for the legitimate practice of medicine.

Is the practice of medicine and surgery of concern to the public health? None but the most hide-bound reactionary can doubt it. It makes little difference to the victim whether he dies from undiagnosed scarlet fever, diphtheria, or ruptured appendix. Each is set down in the record as a preventable death in the statistics of the state and federal health departments. Many groups, official and unofficial, have attempted to evaluate the practice of medicine in this country. In the latest survey, but two and one-half per cent of opinions were expressed by medical health officers, and yet what group of individuals stands closer to the medical practitioner, what group knows more truly the qualifications and characteristics of the physicians by which it is surrounded, or sympathizes more sincerely with the various difficulties constantly confronting them? The worth while health officer soon learns that the success of his work for the public health depends in no small measure on the coöperation which he is able to bring about between his office and the local practitioner of medicine. Each needs the other and neither can go it alone without unfortunate and sometimes disastrous results. It is said that "a good wine needs no bush." This does not apply to the unostentatious, serious minded and scientific physician who has no use for cheap publicity. He needs legitimate backing to have his worth established and his services sought. On the other hand, the successful health officer needs to be a propagandist in the interest of public health, using every legitimate and dignified means to support those factors upon which personal and community health depend, not the least of these being the quality of the medical service available to the community.

Here, then, is a natural alliance already effective to a greater or less degree in a number of states and one which should be set up and developed in all of them. Apparently, the medical profession is not opposed to and as a whole approves of full-time health officers for states and large cities, but is definitely set against the health officer appointed, not by reason of qualifications, but for political motives, and quite often with justice thrown out of office in the same way. Yet medical societies cannot wholly escape responsibility for this state of affairs, which prevails much too commonly throughout the nation.

Is it not time to recognize the fact that health administration and medical practice in the nation as a whole are woefully lacking in uniformity of high standards? Other countries have successfully met this problem by various methods of federal control. Before such a system can be adopted in the

United States, public opinion must be brought to its support as well as the interest and coöperation of other state and local agencies directly or indirectly concerned.

Constitutional objections will doubtless have to be met and dealt with, as well as a formidable opposition from political and personal interests. These should not prove insurmountable.

As a result of various surveys, individual studies and authoritative opinions, factual data are available regarding the problems which must be faced in the field of public health, medical practice, hospital management, licensure, and public health nursing, which should carry conviction to all those with the knowledge of the subject whose minds are not irrevocably closed to progress. Individual studies may still be necessary, but the time has arrived for taking action on the facts that are already known. To this end it would seem highly desirable to form a national committee, under whatever auspices may seem desirable, of outstanding representatives of the interrelated fields of activity involved in the problem to formulate at an early date ways and means for its solution. Even though remedial recommendations be directed at first only to the most outstanding needs, it should have a heartening influence on those who are wearied of academic discussions and long for evidence of definitely constructive progress.

THE PUBLIC HEALTH PROBLEM OF SPIROCHETAL JAUNDICE (WEIL'S DISEASE) IN AMERICAN CITIES

SPIROCHETAL jaundice is receiving more than occasional notice in the scientific literature. Its importance as a public health problem in American cities has heretofore been either disregarded or overlooked. The chief vector is apparently the rat, and this animal seems fated to continue to spread its potent shadow over the transmission of disease to human beings.

In a recent discussion of the paper of Dyer on typhus and its proved dissemination by the flea of the rat, at the meeting of the American Medical Association, Atlantic City, June, 1937, the Health Director of San Francisco pointed out that the rat must be reckoned with likewise in Weil's disease. For instance, in late 1935, 2 men working as cribbers in the city sewers became ill and their disease was subsequently diagnosed as spirochetal jaundice. The clinical diagnosis was confirmed in the laboratories of the George Williams Hooper Foundation for Medical Research of the University of California.

In 1931, the organism *Leptospira icterohaemorrhagiae* was reported in the kidneys of rats in San Francisco by Ridlon [1] of the U. S. Public Health Service. The cases in human beings reported in 1935 marked the presence of the disease in the official reports of San Francisco for the first time. In March, 1937, however, there were reported in rapid succession 4 cases entirely unrelated to each other and in different localities, the clinical diagnosis being confirmed by laboratory examination. An examination by the George William Hooper Foundation of rats caught in the vicinity of one case indicated approximately 33 per cent infection with spirochetes.

The Health Director of San Francisco, in his discussion of epidemiological factors, pointed out that Weil's disease so far has not occurred in extensive epidemics, but that cases are occasionally met with, chiefly among males exposed to contamination by dirty surface waters or damp soils. Various workers have

shown that the disease may also occur among fish workers, coal miners, and those in occupations in which there is close contact with material contaminated with the urine of rats.

One of the unknown factors, as far as transmission to human beings is concerned, is the dog. Another vehicle of infection to human beings may be water, either through the skin—particularly if broken—or through the nasal and buccal mucosae, or perhaps the conjunctivae or lacrimal canals.

It can be considered therefore that Weil's disease is usually dependent upon the spirochetal infection in rats; that it can become a definite industrial hazard, especially involving occupations such as work in sewers, with close contact with rats or their moist excreta. There is in this an additional incentive for more extensive rat control measures and there should be further extension of routine laboratory examination of rats to include the causative spirochetae of Weil's disease, especially in cities of the United States.

REFERENCE

1. *Pub. Health Rep.*, Jan. 2, 1931.

PREVENTING THE CARRYING OF DISEASE BY AIRPLANES

WE have called attention to the airplane with its tremendous speed as an agent for transmitting disease and to experiments in the carrying of mosquitoes, as well as the possibility of their biting at high altitudes. We have also published an article [1] on jungle yellow fever, which, theoretically at least, constitutes a menace to all countries which have close communication with those areas in which the disease is known to exist—now Brazil, Paraguay, Bolivia, Peru, Ecuador, Colombia, and Venezuela. These countries are in close touch with the United States through the airplane. So far the jungle type of yellow fever has not produced urban outbreaks except in a few instances in Brazil and one in Bolivia. However, the increase in the facilities of communication due to good automobile roads, new railroads, and especially airplane services, have caused international sanitarians anxiety and have led them to study carefully this situation.

The Pan American Airways System has been in touch with the Pan American Sanitary Bureau and has formulated certain plans and made certain agreements designed to protect countries in close communication with each other by airplanes.

Among these may be mentioned the vaccination against yellow fever of all flying personnel as rapidly as possible. This will be done at Rio de Janeiro, and, as long as available, at Cristobal, Canal Zone, and at Lima, Peru. The vaccination of flying personnel will also be carried out in Miami, Fla., from December 21, 1937, to March 21, 1938. A form, "Certificate of Origin of Passenger," will be furnished by all traffic offices and agencies to each passenger embarking at any point north of 30° south latitude, irrespective of the direction that his voyage may take.

Airplanes will be fumigated during the night with an efficient insecticide such as that, the formula of which has already been supplied by the U. S. Public Health Service.

REFERENCE

1. Soper, Fred L., M.D., Dr.P.H. The Newer Epidemiology of Yellow Fever. *A.J.P.H.*, Jan., 1937, p. 1.

DIPHTHERIA: IMMUNIZATION BY INTRANASAL INSTILLATION

IN contrast with the percutaneous method of Loewenstein, immunization against diphtheria by intranasal instillations has been advanced recently by Claus Jensen [1, 2] to afford only a secondary stimulus following a single subcutaneous injection of diphtheria toxoid. The toxoid used was a highly refined preparation combined with aluminium hydroxide and the initial subcutaneous injection, when given in doses of 1.0 to 1.5 c.c., equivalent to 35–50 flocculation units, stimulated antitoxin production in 96 to 98 per cent of cases. In children under 7 years, 82 per cent gave no reaction, 11 per cent a very slight local reaction, and 7 per cent a moderate to strong local reaction or fever. As would be expected, older children and adults gave somewhat more reaction.

From the single subcutaneous injection the degree and duration of immunity were not satisfactory to Jensen and he tried the effect of additional intranasal instillations. In rabbits, the intranasal method alone gave rather poor results but following a single subcutaneous injection, repeated intranasal instillations gave rise to a marked and lasting increase in antitoxin titer, even in those rabbits which otherwise responded poorly.

The combined method then was tried in groups of nurses and children in institutions and it was found that the added intranasal instillation produced a higher and more lasting increase in antitoxin titer. The combined method gave 0.1 unit or more of antitoxin in 96 per cent of cases when tested 6 weeks after the preliminary injection, and there was a still better response after another intranasal treatment a year later.

Jensen believes that the effectiveness of the method has been demonstrated, and it has been made obligatory for nurses in one of the large Danish hospitals. He believes also that the method is adaptable to general application both in schools and in the family. Instillations could be given by the child's mother after instruction, and under 2 or 3 years of age they could easily be given during sleep. He recommends in children under 6 years of age that nasal instillation should be repeated every year, in September. In these, and in older children previously immunized, immunity may be reinforced and prolonged by nasal instillations in the presence of an epidemic. In the presence of an epidemic, for those not immunized previously he recommends passive immunization and the use of the combined method simultaneously, the first intranasal treatment being given 2 weeks after the single subcutaneous injection. Over 15 years of age nasal immunization alone should suffice. No mention is made of the Schick test.

While we have not seen Jensen's original paper, the editorials cited indicate that his work was done carefully and based upon reasonable experimental data. The extent to which secondary stimulation following the use of a single dose of a satisfactory preparation of diphtheria toxoid is necessary for the control of diphtheria is an open question. It likely is necessary in order to maintain a high level of immunity in a population where the incidence of cases and carriers is quite low. In other communities, as perhaps in our southern states, such secondary stimulation probably is unnecessary.

The need for a continuation of the antitoxin titer at a comparatively high level has never been demonstrated, nor has the rapidity with which formerly Schick negative persons respond to natural stimuli been determined. Studies now in progress should throw some light upon these questions. In spite of some

individual adverse reports upon the 1 dose method of immunization so much in use in the United States, the entire trend with regard to diphtheria morbidity and mortality appears to be highly reassuring.

While the general application of Jensen's method would seem to be open to some question on the ground of practicability, our thanks are due him for pointing the way to a more effective control of diphtheria, and his results and ideas should be given careful consideration by public health workers.

REFERENCES

1. *Brit. M. J.*, Apr. 17, 1937, p. 826.
2. *Lancet*, Apr. 17, 1937, p. 934.

A MILK-BORNE EPIDEMIC AND ITS LESSON

WE are constantly reminded of the similarity existing between preventive medicine and religion. When things go well the conscience is apt to sleep; when they go badly and there is alarm we are apt to get good again. So it is in preventive medicine. It is especially noticeable in regard to vaccination against smallpox. It requires a good scare from time to time to wake us up and to prevent us from lapsing into a dangerous satisfaction over our accomplishments.

These thoughts have been brought to the fore by a masterly report.[1] In August, 1936, a serious outbreak of typhoid fever occurred in England, affecting Bournemouth, Poole, and Christchurch, with a combined population of approximately 200,000, which was increased during the holiday season by some 60,000, in addition to many who passed through the towns involved without becoming temporary residents.

There were a number of unusual features, and in spite of the very careful study made by Dr. Shaw, of the Ministry of Health, some points are not yet entirely clear. However, it may be stated positively that the outbreak was milk-borne. In July a few cases of what appeared to be food poisoning were seen, and in August other cases suggestive of food poisoning occurred, though only a few days sufficed to show that enteric fever was involved. The Ministry of Health was informed, and Dr. Vernon Shaw was sent to investigate. By August 22, it was clear that an outbreak of enteric fever, probably paratyphoid, existed and that it was due to the milk supply. The only common factor was the consumption of raw milk retailed by one distributor, and pasteurization, which began on August 22, was immediately successful in bringing the outbreak to an end. If anything else were needed to confirm the diagnosis this result would give it.

The investigation was puzzling and prolonged. It was concluded that the milk was infective for some 31 days preceding pasteurization. Approximately 718 persons, 518 of whom were residents and 200 visitors, contracted the disease, 31 cases being fatal.

Investigation showed that there were no persons employed in the distribution of the milk who were carriers or who could be suspected in any way of infecting the milk. This made it necessary to study some 37 farms at one of which 2 persons were found with enteric fever, but neither was the cause of the outbreak, although there is strong presumptive evidence that the milk produced at this farm was the source of the infection of the retailer's supply. There had been a fatal case of enteric fever in an adjoining house 2 years before. A neighboring stream from which the cows drank was polluted by the sewage from a house in which a carrier was living, and which was found to contain large numbers of

typhoid bacilli. How the infection was conveyed from the stream to the milk has not been determined. It is considered possible and even probable that the cows while wading acquired surface pollution of their legs and udders sufficient to infect the milk, although there was regular washing of the udders. Dr. Scott, of the Ministry of Health, makes a suggestion that is hard to accept, that possibly the cows ingested the sewage carrying typhoid bacilli which passed through the digestive tract and were finally discharged in sufficient doses to contaminate the milk. He regrets that this idea came too late for direct proof. If such a thing is possible we will have to revise some of our ideas. When the Ministry of Health of England and such careful observers as Dr. Shaw and his collaborators admit such a possibility it must be considered.

This outbreak has been discussed in several papers but the report from the Ministry of Health has only recently appeared. The modern practice in which large corporations supplant individual dealers makes the bulking of milk necessary, and this, in spite of many advantages, increases the number of persons exposed to any risk. In England there appears to be a lack of legislative power to guarantee safe and clean milk supplies and to insist on pasteurization. As far as the communities affected go, the most recent attempts by the local authorities to get legislative power have not succeeded.

We have often spoken of typhoid fever as a vanishing disease, and its marked decrease has evidently given a false sense of security. Only pasteurization of all market milk can avert such tragedies as the one under discussion. Indeed, typhoid fever is not the only thing that we must guard against by pasteurization. On June 28, 1937, the New York State Department of Health reported a milk-borne epidemic of scarlet fever which began on May 27, 1937, and ended June 4, with 11 cases, but fortunately with no fatalities.

One has but to watch the literature to find cause for insistence on pasteurization of all milk supplies in order to render them safe. A better method may be discovered in the future but so far none has been devised.

REFERENCE

1. Shaw, W. Vernon, O.B.E. Ministry of Health, London. Report on an Outbreak of Enteric Fever in the County Borough of Bournemouth and in the Boroughs of Poole and Christchurch. His Majesty's Stationery Office, *Report No. 81.*

LETTER FROM GREAT BRITAIN

A SEASON OF INTERNATIONAL CONFERENCES

In general it is because there must, or there is hope that there may be, visitors in large numbers from every other country to some particular country, that excuse is provided for the holding of "international" (so-called) conferences on health or other such-like harmless matters. We, in this country, having a coronation, and these others in France having, in Paris, an exposition, there appeared to be adequate reasons for each of us to do something along international lines, and to set the representatives of the nations picking each others brains on this and that and these and those of medical and health practice. Beginning with an international kind of conference on tuberculosis—to which I think I have already referred—we here have gone on to a number of other things, yaws and cremation amongst them. In Paris they have been having meetings almost daily for months and the end does not seem to be yet, everybody in France, apparently, being engaged in trying to find some group of individuals it might be possible to get together for the purpose of discussing some subject in the intervals of visiting the exposition and such of the pavilions as happen to be completed. Conspicuous amongst international conferences held or to be held in Paris are those of the International Union of Local Authorities, on Housing and Town Planning, and of Public Health Medical Officers.

INTERNATIONAL UNION OF LOCAL AUTHORITIES CONFERENCE IN PARIS

The conference of the International Union of Local Authorities is an annual affair, the meeting place being commonly, though not invariably, the capital city of one or other of the countries adherent to the Union. The reason for the choice of Paris on this occasion is obvious. That similar reasons may continue to operate and determine that New York in 1939 shall be the meeting place is a hope that I nourish. The wish is, of course, father to that hope but, after all, not without reason, since the permanent bureau of the Union includes a number of American representatives, several of whom, amongst them Mr. Hoan, Mayor of Milwaukee, and Mr. Ham, Executive Director of the American Municipal Association, attended the Paris Conference, while others submitted reports on one or other of the subjects chosen for discussion—"Atmospheric Contamination in Urban Areas," and "Regulation and Control of the Urban Milk Supply." At the opening meeting of the conference which was held jointly with that of the Housing and Town Planning Congress, there was a very large attendance, and though the bulk of the speeches were delivered in French, we others who have English as a tongue, like the charming old lady from Florida (who flattered me by saying how nice it was to hear English spoken) and myself, or know only German, were able to listen in to a running interpretation of the speakers' remarks by plugging in to the back of the seat in front.

MEETING THE LANGUAGE DIFFICULTY

At the ordinary conference meetings, interpretation was in the hands of the Secretary General of the Union,

Senator Vinck of Belgium, who is possessed not only of a gift of tongues but of an extraordinary ability to summarize in his translation from one language to another the words of a speaker as well as the sense in which he used them. With English this is not any too easy, and as the majority of the speakers—being either American or English—used that language, M. Vinck had quite a task to perform. Difficult as it was, however, it appeared less hopeless than that of the speakers who tried to convince certain delegates from continental countries that pasteurization as applied to milk was not an entirely undesirable process, and that even supposing the problem of atmospheric pollution could be solved by placing a bend (a "soot-trap" so-called) on every domestic and other chimney, it was going to take time. In the discussion on this latter subject quite a good deal was heard of the methods practised and researches carried out in Pittsburgh, the informant being a Polish delegate who had spent some time in that city.

Discussing the milk question, the Mayor of Milwaukee gave a description of the investigations recently carried out into the possibilities and advantages of municipalization of the milk supply, and succeeded in stirring up a good deal of controversy as a result. The conference meetings, though fairly well attended, suffered considerably in this connection from being held at the same time and in the same building—the Maison de la Chimie—as those of the Congress on Housing and Town Planning. Also when it came to functions, like receptions and banquets, or visits to places of interest—garden cities, like Plessis-Robinson or Chatenay, to Suresne to see the very striking open-air school, or to the Beaujon Hospital—so very American in its arrangements—the International Union of Local Authorities delegates found themselves rather elbowed aside by those attending the Housing Congress. Though labelled, like the conference, "International," I failed to find amongst the congress reports any from America. Even Sir Raymond Unwin, the general reporter, who only a short time previously had read a paper in London in which he compared English and American practice in relation to Housing and Town Planning and revealed himself as well acquainted with the situation in the United States, in Paris dealt exclusively with European methods and the difficulties that the people in countries on this side had to contend with.

INTERNATIONAL CONFERENCE OF PUBLIC HEALTH MEDICAL OFFICERS

The originator of the idea of an international conference of Public Health Medical Officers was, I believe, Prof. Parisot, Director of the Institute of Hygiene of Nancy. As a result of his efforts, and with a backing from the French Ministry of Health and the League of Nations (through Dr. Rajchmann who was present), a meeting of what was called the International Organization Committee was held in Paris to discuss the question of program dates suitable for the congress, and so on. As the preliminary meeting was held on the 11th May, the day before that fixed for the Coronation of King George VI, it is not surprising that British Medical Officers of Health were not represented. A number of representatives from other countries did attend, however, including one from the United States (Dr. Strode). Naturally, France was extremely well represented, and importance was added to the occasion by the presence in the chair of Dr. Hazemann of the French Ministry with messages from the Minister himself. In spite of the fact that the program drafted for the congress is quite attractive, dealing as

it does with matters affecting health officers personally as regards their training and status, it is unlikely that British health officers will be present in any numbers. The main reason for this is that the dates chosen are at a time—towards the end of October—when the "recess" having ended, local health authorities and their officers are getting into their stride once more and are busily engaged on the autumn and winter campaign. Amongst individuals nominated to act as reporters to the Congress I may say are included Prof. Jameson of Great Britain and Dr. Strode of the United States. Professor Parisot is to be President, and Dr. Leclainche of the French Ministry of Health, Secretary.

THE ROYAL SANITARY INSTITUTE HEALTH CONGRESS

Although not described as "International" none of those to which I have referred more fully earned that title than the Congress of the Royal Sanitary Institute. Held at Birmingham, July 12th to 17th, this congress though ostensibly like the Institute itself, British, attracted, as it does invariably, many others than representatives from Great Britain and the Dominions and Colonies. Amongst these others it was pleasant to find several from the United States; Dr. Robert H. Riley of Maryland—making a very welcome return visit—representing the American Public Health Association and the Conference of State and Provincial Health Authorities of North America, and Dr. Allen Freeman—another old friend—delegate of Johns Hopkins University, with, in addition, Drs. Griewe, Hiller, and Benjamin, present on behalf of Cincinnati. Other countries represented were Germany, Italy, Guatemala, Iran, Roumania, China, and a number of others. To welcome these visitors it is usual for the Institute to hold an "Overseas Luncheon." On this occasion this practice was followed and a number of the guests were good enough to address the gathering. It had been intended that the principal speaker should be Dr. Freeman but, unfortunately, on account of illness, he was unable to be present. Dr. Riley, however, deputised most acceptably for him, recounting a number of fantastic adventures in which your correspondent, at his last very happy visit to America, is supposed to have been involved. The success which attended this function was shared by all the others of the congress week. The meetings for discussion were extremely well attended—as they might well be since the numbers present exceeded 1,800—and much very useful work was done. The Minister of Health, Sir Kingsley Wood, delivered an address, announcing the opening of a health propaganda campaign in the autumn, in which all health authorities would take part, and expressed gratitude to the Royal Sanitary Institute for services rendered on behalf of the public health. The congress of 1938, it was announced, would be held in Portsmouth.

CHARLES PORTER, M.D.

11th August, 1937

PUBLIC HEALTH EDUCATION*

"I Don't Agree With Your Comment"—Or, "I don't like what you said about . . .," or something similar, should open many letters addressed to the editor of this department. Such letters would be good for the editor, and readers would delight in them.

Sometimes there could be letters saying: "I like what you said about . . . because . . ." Be very sure to include a "because."

How Do You Pick Your Topics?—What rules, principles, or policies guide the selection of subject matter for radio talks or press releases?

How is a decision arrived at, and who does the choosing?

Please contribute a paragraph or two for a symposium on the subject, and thus help in gathering information which should be of value to many.

Welcome to the Fraternity!—To Adele E. Yoe, Louisville, Dept. of Health; Milvin Price Isaminger, Dist. of Columbia Health Dept.; Daniel C. McCarthy, National Tuberculosis Assn.; and all of the others who have joined the ranks of health educators in the past year, a cordial welcome and hearty congratulations.

The men and women who came in ahead of you are well worth knowing, and there is no finer work in the world to be done.

We hope that you will come half way by attending the annual meeting of the Section, and participating in this *Journal* department.

The Beginnings Were in New York City—In the early spring before the 1921 Annual Meeting in New York the suggestion was submitted to the Executive Secretary that time be given to health education. The Executive Secretary said "yes," and asked that a program be arranged. Thus in October two half day sessions were held in a ball room of Hotel Astor.

The attendance and the interest warranted the next step, the election of officers for a provisional section. Unfortunately the elected chairman went for a long stay in Europe, but in his absence a program was completed for sessions at the Cleveland meeting.

There the new section conducted its first clinic. After several reasonably successful annual programs the section was officially accepted as a permanent feature of the A.P.H.A.—and now we return to New York City with a record of honorable achievement.

May the second New York gathering give new impetus to this coöperative service in health education.

A Possibility in Coöperation—An example of the possibilities which beckon in many directions:

> Radio playwriting among 4-H Club members in Oregon seems to illustrate one of many diverse channels to be utilized by alert and imaginative health educators. Naturally 4-H Club members and other groups are interested in considering material which might be suitable for the medium in which they are working.

"Mark Time" as a Teacher—Of all the characters created to talk health, "Mark Time" of the New Jersey *Public Health News* (Trenton) seems the nearest to a real human

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N.Y.

being in his shrewd analysis and homely discussion of local health problems. Of course Mark could not function without his pal, "Ben Hustler," garage man, as a foil.

In the August, 1937, issue, Mark and Ben are discussing a disastrous Sunday School picnic. Ben says:

"I suppose they've put up a sign to warn people not to drink there any more."

"Yes, but—shucks!—you can't put signs on every pipe, brook or spring in the state. Folks ought to know by this time that they are all risky."

"Maybe they put too much trust in the Lord," suggested Ben, with a whimsical smile.

"Well, now, it's all right to put trust in the Lord for what you can't help and maybe He can, but as for drinking water from a pipe or spring or any other place we know nothing about, I reckon He expects us to use our own brains and decide to leave it alone."

A Radio Anniversary in New York—As reported in *Health News*, New York State Dept. of Health:

The department's radio players, the Health Hunters, celebrated the completion of their fourth consecutive year on the air with a special broadcast from Station WGY on Wednesday, August 11, at the regular hour, 2:15 p.m.

Initiated in March, 1922, shortly after station WGY was established, the department's radio health program has been on the air continuously for the past 15 years with the exception of a few interruptions occasioned by special broadcasts. For the first 11 years, it consisted of a series of weekly 5 minute health talks which were superseded in August, 1933, by the present 15 minute Health Hunters plays.

So far as known, the department broadcast is the oldest continuous program on the air today and is the only one of the original WGY presentations still on its regular weekly schedule.

In State and Local Department Bulletins—Here is what a few recent issues carried:

The first half of 1937 (Stockton, Calif.) . . . Anemia or lack of good blood (Oregon) . . . A study of type II pneumococcal pneumonia (Rochester) . . . Rabies and black widow spiders (Pasadena) . . . Activities for the fiscal year (Bakersfield, Calif.) . . . Whooping cough (San Jose, Calif.) . . . Changing public health practices and problems (New York State) . . . Eradication of syphilis (San Luis Obispo, Calif.) . . . An outbreak of milk-borne scarlet fever; syphilis yesterday and today (Michigan) . . . The city health, Jan.–June (Baltimore) . . . Vital statistics for 1936 (Kentucky) . . . The health officer and the venereal disease control program (Lincoln) . . . Vacation warnings (Albany) . . . Not a diphtheria death for 28 months (Salt Lake City) . . . A new and potent test for milk pasteurization (Westchester) . . . Diarrhea and enteritis under 2 years of age (Ohio) . . . Extermination of rats (Colorado Springs).

The above does not represent all of the topics, especially in the case of the larger state bulletins.

Mass Distribution of Health Information—How to reach a considerable group of people who may or may not be reached otherwise is reported in *Bulletin*, National Tuberculosis Assn., 50 W. 50th St., New York, N. Y., Aug., 1937.

The Tuberculosis Society of St. Louis has been using metal racks hung in public buildings.

Since this project was inaugurated in 1935, approximately 140,000 pieces of literature have been distributed through the 25 racks now located in the St. Louis area.

They find that pay envelopes are also proving a satisfactory means for distributing health literature. Each month over 14,000 folders are provided to 91 industrial and business firms for pay envelope stuffing. Frequent requests by companies for changes in the number of folders to meet pay roll fluctuations have proved that the organizations are actually using this material.

Cancer Education in New York State—The State Institute for the Study of Malignant Diseases reports:

During 1936, the Division of Cancer Control under which the work of the institute is administered has emphasized lay education in cancer control, especially in the rural districts. Illuminated transparent photographs

of precancerous and early cancerous conditions, together with models illustrating the various methods of treating the disease, have been shown and lectures given at meetings of farm organizations, county fairs, and before other groups in small communities. Similiar talks and exhibits have been given for civic, women's and church clubs.

A particularly interesting new feature of the division's educational program last year was the presentation of cancer talks before high school students. Experience has shown that young people of high school age are intensely interested in cancer, and since they are observant and should be able to detect possible precancerous lesions in their parents, it is believed that these students are an effective medium through which to spread knowledge about cancer.

Educational activities among the medical, dental, and nursing professions have also been intensified and extended. Two courses covering the entire cancer problem were given for physicians, one in conjunction with the Erie County Medical Society and one in conjunction with the Monroe County Medical Society. Lectures illustrated by lantern slides and in some cases by actual specimens were given by members of the division's staff. Exhibits including transparencies, wax models, pathological specimens, and apparatus for the radiation treatment of disease were presented at meetings of the State Medical and State Dental Societies as well as at regional meetings of the medical profession.

WANTED

Wanted: information about ready-made *lantern slides for popular audiences.* Will national agencies and other organizations please tell about any slides available by loan, rental, or purchase for use in other cities and states? Please address the editor of this department.

Wanted: information about *exhibits* which will be loaned or rented outside the state of origin. Address the editor of this department.

The above information is for compilation of lists for the use of health workers. Any one who has a clue to *slides* or *exhibits* is urged to let us hear about it.

Wanted: dialogues or dramatizations for broadcasting. Address: Dr. John L. Lavan, Health Officer, Grand Rapids, Mich.

Wanted: addresses of makers of *mechanical and electrical devices* for use in making up health exhibits. Address: Walter Peiris, Pioneer Maternity and Child Welfare Exhibitors, Sans Souci, Moratuwa, Ceylon.

Wanted: printed matter on health topics, and *lists of publications* for sale which might be used by a high school teacher. Address: Nancy M. Miner, 1409 Channing Way, Berkeley, Calif.

BULLETINS OR HOUSE ORGANS

The mailing list for the *Bulletin* of the Kentucky Dept. of Health includes: physicians, ministers, school teachers, members of women's clubs, local registrars of vital statistics, undertakers, Y.M.C.A. workers, state and county officials, members of the legislature, and every newspaper in the state.

Monthly Bulletin, Dept. of Public Health and Sanitation, Colorado Springs, Colo., is an example of the statistical type of bulletin. However, the second page is used for educational material. Would it not be better to run the educational material on the first page, moving the report of the Bureau of Communicable Diseases to the second page?

"Motherhood in Bondage" is the theme of *Birmingham's Health,* Jefferson Co. Board of Health, Birmingham, Ala. (Aug., 1937). The issue reports on a study of maternal deaths. A series of pictorial diagrams add effectiveness to the report.

"Summer is Now Safest for Babies" is a simple diagram in *Public Health News,* State Dept. of Health, Trenton, N. J. Aug., 1937. It shows "comparative infant death rates by months of year," with horizontal lines for 1916 and for "today." August, 1916, is the peak, with August as the low point in 1937.

"Why Register Births and Deaths" is a half page summary in *Bulletin*, State Dept. of Health, Louisville, Ky., June, 1937. The reasons are listed under these sub-headings: to prove the fact of birth . . . date of birth . . . place of birth . . . fact of death . . . facts about deceased, to furnish birth statistics, to furnish official statistics for health departments . . . for life insurance . . . for mortality statistics . . . for estimating population. The details of the summary supply usable material for a good newspaper feature writer.

MAGAZINE ARTICLES

"Hazards of Life." Editorial. Neither job nor sport need be given up to avoid accidental injury. *Collier's*. Aug. 31, 1937.

"Health Without Wealth," by D. Pearson. Examples of successful co-operative financing of medical services. *Common Sense*, 315–4th Ave., New York, N. Y. Sept., 1937. *25 cents*.

"Make them Walk," by S. Woodward. *This Week*, the Sunday newspaper magazine section. Aug. 8, 1937. "See that your youngsters use their legs instead of the family car." How children are being made "soft"; how college football teams and other groups of winning athletes largely come from those who must walk.

"This Priest Sacrificed His Life for Lepers" (3 picture pages about Father Damien); "The Story of the Iron Lung"; "Are You an Ozzie?" (a character who caricatures "the kind of driver involved in most fatal accidents"). *Look*, Des Moines, Ia., Aug. 31, 1937. *10 cents*.

"What Goes Up—" by P. W. Keansey. *American Magazine*, 250 Park Ave., New York, N. Y. Sept., 1937. Accidents via dust and gas explosions in homes and elsewhere.

"Women and Athletics" (sports good, sports bad, and why), 6 pages; a page in the life of "Ozzie," the accident-causing auto driver. *Look*, Des Moines, Ia., Sept. 14, 1937. *10 cents*.

FOR EDUCATION OR REFERENCE

"Developing a Housing Program in a Southern City," by Graves and Fletcher. Reprint. *Free* from Health Dept., Memphis, Tenn.

"Institutional Mortality With Reference to Residence Allocation," by E. Parkhurst. *Reprint*. State Dept. of Health, Albany, N. Y.

"Is Some One Sick in Your Home?" is an 8 page (5¼ x 7¾ inch page) booklet; large type, well leaded; 6 simple sketches. Tells how to protect others from infection by the patient. State Dept. of Health, Albany, N. Y.

"What Happens to the Cancer Patient in Connecticut," two mimeographed pages, seems to be an especially useful statement for popular use. John Doe has a little spot where his glasses touched his nose. The simple recital of what Doe did and the steps taken by his physician and other physicians, and the successful outcome, should be reassuring to many. State Dept. of Health, Hartford, Conn.

"Accidents and Opportunity." Accident Prevention Conference, Dept. of Commerce, Washington, D. C. Place and cause of accidents. 14 pages. *Free*.

"Mad Dog!" (telling a child how rabies may be controlled); "The Introduction of Bacteriology Into the Service of Public Health in Chicago." Reprints. Address the author: Dr. F. O. Tonney, 55 E. Washington St., Chicago, Ill. *Free*.

"Studies of Community Planning in Terms of the Span of Life," by C. F. Lansing. New York City Housing Authority, 10 E. 40th St., New York, N. Y. With picture diagrams; illustrated by recent housing developments.

If you have overlooked "This Business of 'Keeping Informed'" you

will want to ask for a copy. Issued by the American Public Health Assn., it tells about the New York meeting, and why health workers will attend. It's good stuff to use in getting fellow workers to attend the next annual meeting. Anyway, every one who fails to attend a public health convention should be influenced by page one of the folder.

Also there is "A Pound of Feathers or a Pound of Lead," a little booklet which classifies advertisers and tells why they advertise in the *Journal*. Something for the reader who wishes to boost the *Journal*.

Children's Bureau, Washington, D. C.:

"Infant and Maternal Mortality Among Negroes," by E. C. Tandy. Reprint.

"The Health Education Program of the Children's Bureau, With Particular Reference to Negroes," by K. F. Lenroot. Reprint.

"The Causes of Stillbirths," by Dunham and Tandy. Reprint.

From American Medical Assn., 535 N. Dearborn St., Chicago, Ill.:

"Cattle's Contribution to Mankind," by J. A. Myers. Reprint. *10 cents.*

"Measles," by E. B. Perry. Revised reprint. *10 cents.*

"Scarlet Fever," by E. B. Perry. Revised reprint. *10 cents.*

Reprints from *Public Health Nursing*, 50 W. 50th St., New York, N. Y. (*10 cents each*):

"Salaries of Public Health Nurses in 1937," by A. J. Miller.

"Impediments to Maternal Health," by Dr. Thomas Parran, Jr.

"Forms for Reporting School Health Service," by A. J. Miller.

"Health Teaching in a Secondary School," by M. E. Bowen.

"The Past Challenges the Future," by E. G. Fox.

"A Tribute to the Public Health Nurse," by Dr. Livingston Farrand.

DATES AHEAD

From George A. Dundon, Milwaukee Health Department:

Regarding Dr. E. O. Chimene's quest for a calender of notable days, weeks, or events for use in a radio series, as noted in the June *American Journal of Public Health*, we suggest Mary Emogene Hazeltine's 300 page book "Anniversaries and Holidays," published by the American Library Association, Chicago, Ill. Doctor Chimene may find helpful especially the classified index of medical scientists, including physicians, surgeons, anatomists, physiologists, and workers for public health; bacteriologists, botanists, chemists, physicists.

MATTERS OF TECHNIC

If a camera is being considered by the health department, or health association, especially if a miniature or "candid" is being discussed, it may help a lot to look up "Crafty Americans," by C. Norcross. In *Colliers*, for July 10, 1937. See page 58 for the camera data.

If you consider using billboard space along highways you may well look over *Roadside Bulletin*, National Roadside Council, 119 E. 19th St., New York City. *10 cents.*

"Teaching About Tuberculosis by Isotype," by Otto Neurath. *Bulletin*, National Tuberculosis Assn., 50 W. 50th St., New York, N. Y. April, 1937. Here is Dr. Neurath's own interpretation of the educational significance of the pictured statistics with which his name is associated.

BOOKS AND REPORTS

Shadow on the Land—"Syphilis" —*By Thomas Parran, M.D., Surgeon General of the United States Public Health Service. New York: Reynal & Hitchcock,* 1937. 309 pp. Price, $2.50.

At a time when there is an awakening of interest and activity in syphilis and its control in this country comes Dr. Parran's new book—*Shadow on the Land*—to clarify our thinking, to guide our endeavors and to fortify our enthusiasm in the attack.

As one reads this comprehensive but simple book one gets the feeling that a master-hand is leading one through the intricacies of syphilis, weighing and measuring the many problems in a clear-cut authoritative fashion, sifting the important facts from the vast amount of data accumulated. Dr. Parran does not hedge on the many vital questions involved in the problem, whether it be the part that organized medicine should play or the control of prostitution. He frankly and simply gives his opinions and answers. His conclusions are unbiased and based on careful and thoughtful personal study of a problem in which he has long had an intense interest and concern.

Shadow on the Land is written in a style that is easy to read, and the occasional personal references give it a touch of delightful intimacy with the author. The book should be read and studied by every health officer. Every physician should be familiar with its content. Health and social workers will find in it many guiding principles. Equally important, the general public and governmental officials, who are interested in personal and community advance, will find in this volume help for better living and economy in government.

The outstanding thesis of Dr. Parran's book is that syphilis is one of our greatest and most devastating public health and medical problems. Syphilis is a communicable disease that can be brought under control in a generation if necessary funds are made available and if our present knowledge of this disease is applied enthusiastically by government, medicine, public health, and the general public.

In this book Surgeon General Parran has not only defined the pathway toward syphilis control but has brought out effectively and forcefully the importance and the place of public health in our national life. JOHN L. RICE

Who Gave the World Syphilis? The Haitian Myth—*By Richmond C. Holcomb, Captain, Medical Corps, U. S. Navy, retired. New York: Froben Press.* 190 pp. Price, $3.00.

It is well known even to the casual reader of medical literature that there is a large body of opinion, embracing medical historians on both sides of the Atlantic, which holds that syphilis is a disease wholly of American origin, and was imported into Europe with Columbus upon his return from his first voyage. In this volume, Holcomb reviews the chief source material upon which this opinion is based, and finds clear evidence that the disease was widespread over Europe and the Near East before Columbus returned from

his second voyage in 1496. In fact, he finds reason for believing that the disease was recognized by the Greeks, Romans, and Arabs in very early periods.

Inasmuch as Ruiz Diaz de Isla (1462–1542?) is considered the most convincing authority supporting the Haitian origin of syphilis, Holcomb's study deals principally with de Isla's book, first printed in 1539.

It appears that de Isla, having no first-hand knowledge of Hispaniola, derived his information from the works of Oviedo, Las Casas, Gomaro, Herrera, and others, all of whom extolled the virtues of the Holy Wood (guaiac) in the treatment of the "new" disease; and that de Isla accepted this alleged efficacy of guaiac as proving the place of origin of syphilis, his argument being that God always provides a remedy for a disease at the place where that disease was inflicted as a punishment for sin.

However, de Isla, having thus asserted a Haitian origin, proceeds to give a contrary account, clearly stating that the "new" disease was identical with that described by Pliny as having been introduced into Rome in the time of Pompey.

From such textual criticism, Holcomb goes on to examine contemporary writings, edicts, chronicles, and other source material for the light they throw on the question; and then to review at length the humoral philosophy current in the 16th Century with reference to its influence in determining views regarding the nature and origin of syphilis.

There follow a concise summary of de Isla's work, and finally brief comments embodying the conclusions emanating from this particular study. It will suffice here to say that Holcomb believes the work of de Isla to be of no value in proving a Haitian or American origin for European syphilis.

The substance of the study in so far as apposite to the title may be found in the final section "Some Comments"; but those who read the book leisurely for its intrinsic value will be well repaid. Hence, the book may be read for the evidence it presents regarding the geographical distribution of syphilis within the historical period, or for enjoyment. It is to be recommended for either purpose.

H. W. SMITH

Principles of Bacteriology and Immunity—*By W. W. C. Topley and G. S. Wilson. (2nd ed.) Baltimore: Wood,* 1936. 1645 pp. including index. Price, $12.00.

The first edition of this book gained almost immediate popularity and has been widely used both as a text and as a reference. The second edition consists of a single volume instead of two, which we regard as an improvement.

The preface points out the difficulties encountered by the authors. The advance in bacteriological knowledge has been so great that adequate reference to all new work would lead to an expansion impossible in a work of this kind. Selection has therefore been pushed far but we believe with good judgment. The new edition has stressed the work which bears on diagnosis, prevention, and treatment of infectious disease. In order to compensate for the necessary additions some omissions have been made, chiefly concerning observations the value of which cannot at present be assessed. Where long-standing problems have been solved historical data have been cut down.

As in the first edition the infectious diseases of animals, especially those which are transmissible to man, have been treated more fully than is usual in a textbook. The authors properly point out that the boundary between medical and veterinary science has be-

come very indistinct and the importance of animal diseases to public health is such that both physicians and veterinarians should know the bacteriology of both.

The use of this book for teaching purposes has led the reviewer to believe that the objectives announced have been well carried out. There are some omissions which are not serious. The authors recognize the menace of bovine tuberculosis to human beings. It is perhaps natural that in view of the extensive and accurate studies made in England they should refer chiefly to English sources, but it would be only fair to recognize that at the Congress on Tuberculosis in 1901 it was an American who was called on by the authorities to combat the errors of Robert Koch, and who had the only evidence at hand to correct what the authors call the " quite inadequate experimentation " on which Koch based his statements. American work gave the first positive proof of the danger of bovine tuberculosis to human beings but is referred to only casually, and not mentioned in the index, while the work of the Royal Commission on Tuberculosis is given first place. This is neither fair nor accurate historically, and is the less excusable since the Congress at which Koch made his blunders and which were combated immediately by an American took place in London.

The book is well printed and unusually free from errors. The index is good. The illustrations are of the average type. The book can be recommended both as a text and as a reference, though rather large and heavy for the average medical student.

MAZŸCK P. RAVENEL

Group Leadership—*By Robert D. Leigh. New York: Norton,* 1936. 259 pp. Price, $2.50.

Modern society finds it increasingly desirable to work in groups. This book is a valuable contribution to the growing volume of literature which attempts to facilitate such group work. It is intended for those who may find themselves called upon to preside before large or small gatherings, as well as that larger number of people who participate in the deliberations of such gatherings.

For many years rules of procedure devised for parliamentary debate have served poorly to direct the deliberations of non-parliamentary bodies. President Leigh renders a great service by describing modern rules of procedure which provide for the orderly dispatch of business in those non-parliamentary groups with which most of us more frequently come into contact. Health officers, public health nurses, engineers, and public health workers generally will find this a most useful guide for their participation in department conferences, committee meetings, the sessions of professional and scientific meetings, and wherever a group meets jointly to consider a common problem. One wishes that college presidents might more often, as President Leigh has done, address themselves to the task of aiding the average individual in his everyday problems.

HOMER N. CALVER

Municipal and Rural Sanitation —*By Ehlers and Steel. (2nd ed.) New York: McGraw-Hill,* 1937. 477 pp. Price, $4.00.

Advances in the field of sanitation in the past decade made a revision of the original edition of this book advisable. Many chapters have been brought up to date and much new material added, particularly with reference to milk control, plumbing, industrial hygiene, and noise abatement. Other changes and additions throughout the book will undoubtedly improve its usefulness.

The book is an effort on the part of the authors to place in a convenient form the minimum of practical information relating to the principles of sanitation. While no attempt is made to cover in detail the vast amount of subject matter, the book very well covers the principles of sanitation and practical applications for solving the numerous problems confronting the sanitarian. For those readers who desire further information along particular lines a selected bibliography will be found at the end of each chapter dealing with the subject.

While the book takes up a multitude of items, the material is presented in a language understandable to the lay person as well as to the health officer and sanitary engineer. Because of this feature, it is felt that the book should serve a very useful purpose. Many persons engaged in both municipal and rural health service have not had the advantages of specialized training in sanitation. Much of the knowledge of sanitation possessed by these people has been the result of experience and observation and their judgment may often be unreliable. This is equally true of many city engineers, city managers, and other public officials. The authors, from their fund of practical experience, apparently had this in mind and have prepared the book to serve as a reference work of the fundamentals of sanitation for those who are called upon to deal with problems requiring a knowledge of sanitation.

It is also felt the book should serve as a most practical textbook in the courses for sanitarians now being conducted in various schools as well as at field training stations for public health workers being established in many states. H. A. KROEZE

Public Works Engineers' Yearbook, 1937—*Chicago: American Public Works Association,* 1937. 282 pp.

This, the Seventeenth Annual Proceedings of the International Association of Public Works Officials and the Forty-Second Annual Proceedings of the American Society of Municipal Engineers, contains several articles of interest to public health officials; primarily engineers. Sewerage, sewage disposal, refuse collection and disposal, housing, and water supply matters are briefly touched upon by different authors. ARTHUR P. MILLER

Food Technology—*By Samuel C. Prescott, Sc.D., and Bernard E. Proctor, Ph.D. New York: McGraw-Hill,* 1937. 630 pp. Price, $5.00.

The recent development of the new science of nutrition has been paralleled by the organization of a vast food industry. This essential industry has mobilized all branches of science for practical application to the many problems of production, conservation, and distribution of the quality foodstuffs comprising the modern varied diet.

This impressive book is designed to aid in training the scientific personnel now required in the food industry. For this purpose, as well as for reference by food manufacturers, nutritionists, and others concerned with the biology, chemistry, physics, and engineering of food preparation, preservation, and sanitation, it should be eminently satisfactory, since it is comprehensive, authoritative, and readable.

Included in the well printed text are chapters on cereals, fruits, vegetables, meats, fish, dairy products, and sugars, and on baking, canning, refrigeration, dehydration, and on various prepared commodities, such as condiments, jellies, confectionery, etc. The book is well documented and has a good index.

There has long been a need for a manual of food technology of this nature, which in this instance is an

outgrowth of the noteworthy courses presented for a number of years at the Massachusetts Institute of Technology. The book should be of distinct value to sanitarians and other scientists who are concerned in any way with the production and control of quality foods.

JAMES A. TOBEY

How to Interpret Social Work—*By Helen Cody Baker and Mary Swain Routzahn. New York: Russell Sage Foundation,* 1937. 79 pp. Price, $1.00.

This volume is a practical, loose-leaf course of study representing the ABC's of interpretation. While designed primarily for social workers to aid them in conveying their message through the spoken word, the written word, and visual methods, as well as in planning their programs, the volume will be also helpful to health workers. Many effective illustrations are given, several being drawn from the health field.

In the use of this course, it is contemplated that local leadership will be provided to groups interested in informal study. Specialists in various technics covered in the lessons may be helpful as consultants, but an ability on the part of the leader to stimulate discussion and hold it to the matter in hand is considered of first importance. Here is a useful instrument for the stimulation of group thinking and community planning of publicity programs.

IRA V. HISCOCK

The Anatomy of Personality—*By Clements C. Fry and Howard W. Haggard. New York: Harper,* 1936. 357 pp. Price, $2.00.

This important contribution to medical and psychiatric thinking is a timely reminder of the influence of the early Greeks who placed pertinent significance upon various types of body builds, plus Versalian emphasis upon anatomy as a basis for the understanding of variations in health and disease.

The authors attempt to summarize the essentials of structural analysis of personality in order that the reader may obtain further insight into his own personality, but also insight into the behavior tendencies of others.

An eclectic approach is espoused although due credit is given to the "masters": Freud, Jung, Adler, Kretschmer, Meyer, Schneider, Kahn, and others. The presentation emanates from the study of psychopathic personalities, although the authors' interest is not essentially with the abnormal. It is well emphasized that the normal man varies only in degree, and not in kind, from the psychopathic. Their first consideration is for the normal man whom they describe as the average man—"one who is neither a misfit in the environment and society, nor yet equally abnormal, a genius. . . . Few men show personalities so neutral as to be free from all distinguishing peculiarities."

There are 8 chapters which concern themselves with The Manners of All Men, Realities That Lie in the Flesh, Freedom That Grows with the Mind, Bondage in Moods and Emotions, The Meek, the Mild, the Militant, and The Streams of Life. There are a number of well chosen illustrations emphasizing different body builds, particularly head and shoulder sketches.

Issue may be taken with the authors' concept of "character" in contrast to "personality." "Character is a product resulting from the action of the environment upon the personality." The adaptation of the personality, the conditioning of its inherent qualities, thus results in patterns of reactions and modes of behavior which in time become the character.

Human personality is analyzed into 5 basic elements: physical, impulse or driving force, intelligence, temperament, and ego. Each of these is elabo-

rated upon in succeeding chapters as they influence behavior.

The authors are to be commended for their scientific objectivity in presenting such complex facts and factors influencing personality functioning, especially in the light of our present-day limitations of knowledge. Although they note an association between physical and certain general tendencies of the personality, it is not an exact association, but rather points to the direction of certain traits of personality. The various personality traits usually found associated with different personality types, chiefly those described by Kretschmer, are succinctly delineated. Their variation from abnormal expression to the extent of psychopathological and mentally ill prototypes is clearly described. Wholesome caution is tactfully pointed out in order that the danger of drawing unwarranted conclusions may be avoided.

In the final paragraph the authors bring to the front in stimulating manner the importance of human impulses and drives which are metaphorically described as "the streams of life." Their influences in molding personality and character patterns are expanded. The effect of sublimation and suppression are noted, and emphasis is placed upon the significance of evaluation in achieving a well rounded and integrated personality.

A critical stocktaking of individual endowment and patterns of reactions to life experiences is urged in order that mechanisms of character formation may be recognized and applied in a melioristic manner. "It is this structure revelation of personality that has been the sole purpose of this book . . . no further is its scope." Every student interested in human biology will be refreshed by this lucidly written book which abounds in case references and illustrations to drive home its relativistic conceptions. The critically formulated content of this book will be stimulating to all those who seek a better understanding of personality functioning through espousing a more significant observation and evaluation with respect to physical-mental interrelationships. In this connection it is important that the integration concept be at all times kept in mind in order that the human being be not artificially departmentalized in a dualistic or even polymorphous manner, but rather seen functioning as a total unit at all times.

FREDERICK L. PATRY

Ten Million Americans Have It! —*By S. William Becker, M.D. Philadelphia: Lippincott,* 1937. 220 pp. Price, $1.35.

This book is an attempt to present the facts with regard to the public health control and clinical management of syphilis in such a way that it is understandable to the average individual. It describes briefly the history of the origin of syphilis. Of special interest are the chapters describing the course of the syphilitic infection and the modern methods of diagnosis and treatment. Syphilis as a public health and social problem is emphasized.

R. A. VONDERLEHR

Textbook of Applied Biochemistry for Pharmacists and Pharmaceutical Students—*By Frank Wokes. Baltimore: Wood,* 1937. 522 pp. Price, $5.00.

The title of this book may be misleading by not being sufficiently comprehensive. We have in this not merely a textbook for pharmacists and pharmacy students but for all persons interested in the newer developments of biology, pharmacology, and medicine. Where else may one turn to find in one volume a complete (to date) catalogue of the vitamins, including their occurrence, history, discovery, method

of preparing, of testing, of isolating or synthesizing the active agent as a pure chemical, of describing uses and applications in human nutrition, and all told in understandable words. Then too, the author describes methods of cooking to avoid losses of vitamins; artificial means of fortifying the vitamin content of foods and even of enhancing the vitamin content of milk and butter by way of improving the diet of cows.

In the chapter "Fats" the known fatty acids are listed and, where found, their chemical formulae and peculiar linkages and the ultimate fate of the fats we eat; also their relation to diabetes. Besides these facts the reader discovers that within the normal fat there occurs a complex alcohol cholesterol which now is found to be the base of certain vitamins and of the hormones, particularly those concerned in sexual activities.

The subject of hormones is treated at length and most interestingly to show their importance in regulating life processes—serving as chemical messengers by way of the blood stream to arouse certain organs or muscles into unusual activity and thus secure an immediate effect. This is illustrated, for example, by summarizing the therapeutic properties of adrenalin, the hormone derived from the adrenal gland—to arrest hemorrhage, localize anaesthetic action, relieve asthmatic attacks and restore heart action in anaphylaxis and shock from other causes.

The Chapter "Bacteria" includes a table of types with their outstanding characteristics; notes on variations in vitality, in staining, in resistance to bactericidal agents, in fermenting sugars; sub-divisions treating on sterilizing pharmaceutical preparations, on aseptic technic, on chemical methods of destroying bacteria experimentally and in practice, with critical comments on specific substances. With some of the statements the reviewer is not fully in accord but the effectiveness of a germicide depends on too many factors to suggest criticism.

The author makes no pretense of presenting new and unverified data; he acknowledges his indebtedness to many sources for the information, data, illustrations and figures reproduced. His own work, however, is not to be ignored.

The book is unusual in its comprehensive treatment, from every point of view, of the biological substances used in medicine. It is chemistry, biology, materia medica, physiology, and physical chemistry presented in a manner and wording alike interesting to the layman and to the scientist.

HERBERT C. HAMILTON

Bacteriology of Specific Communicable Diseases. Handbook of Public Health Bacteriology. *San Francisco, Calif.: Department of Public Health,* 1937. 141 pp. Price, $1.50.

We have received from the Department of Public Health, City and County of San Francisco, of which Dr. J. C. Geiger is the Director, this very cleverly gotten up handbook. It is designed to correlate the activities of a public health laboratory more closely with other branches of public health administration. The introduction warns us against the misuse of the laboratory through excessive routine without analysis; through improper specimens or improper handling of specimens; and through lack of data. Etiologic diagnosis is stressed though not at the expense of clinical diagnosis, and both are considered necessary for best results. It has been produced in recognition of a need for condensed general information usually available only from a number of sources covering medicine, field work, epidemiology, and laboratory technic.

The announced object of the book has been successfully accomplished. We regard it as one of the most practical guides that have come to our attention. Its value is increased by a good index. It is bound in loose leaf style and is a size to fit conveniently in the pocket of the field worker. We commend it to all those for whom it has been designed.

MAZŸCK P. RAVENEL

Safety Through the Year—An Activity-Text Workbook for Intermediate Grades—*By Florence Nelson and H. Louise Cottrell. New York: McGraw-Hill,* 1937. 96 pp. Price, $.52.

For the units, which cover the usual items in safety instruction, there is a short list of Questions for Discussion, questions to which the child writes the answer, and blank pages for pictures or short essays on various accident factors.

Several states now issue courses of study on accidents and their prevention. Definite reference to these would help the teacher.

CHARLES H. KEENE

Duties and Qualifications of Tuberculosis Executive Secretaries, Administrative Series No. 2—*By George J. Nelbach. New York: National Tuberculosis Association,* 1937. 32 pp.

This monograph outlines the duties of executive secretaries and prescribes the personal and educational requirements for the satisfactory fulfillment of the task. Standards are suggested for the selection and preparation of personnel, which are also appropriate for other types of health workers. Based on years of practical experience, the author has prepared an effective educational instrument for executive secretaries, a useful guide for boards of tuberculosis societies, and a helpful text for instructors of men and women in training for this type of work. The booklet is well printed; the material is organized in a logical manner, and is supplemented by a carefully selected bibliography.

IRA V. HISCOCK

Butter and Oleomargarine: An Analysis of Competing Commodities—*By W. B. Pabst, Jr., New York: Columbia University Press,* 1937. 112 pp. Price, $1.50.

The approach to the subject is economic and statistical, and so provides a backbround which is possessed by few students of public health and nutritional problems. It is the opinion of the reviewer that this is the proper approach, for the reason that the controversies between the butter and oleomargarine industries are primarily economic.

Chapter I describes the development of the two industries and contains a summary of the number of establishments engaged in each industry, the value of the product per establishment, and the costs of labor and materials in the two industries.

Chapter II is a discussion of the Restraint of Competition Between Butter and Oleomargarine. Because of the inevitable handicaps of agriculture the federal government has adopted a policy of subsidies to this industry, and this is the basis of the controversy between the butter and oleomargarine industries. Numerous disputes and legislative acts were a consequence, and there is no prospect that these will diminish. This situation is further complicated by the importation of foreign oils and by inventions which make possible a wider use of domestic oils.

Chapter III evaluates butter and oleomargarine as competing commodities, and is of primary interest to students of marketing and statistics. Table 2 contains useful data on consumption and production of the two

products, and on their price relations.

Chapter IV considers the effects of future taxation of oleomargarine, and so of necessity enters a controversial field. A quotation on this point may be pertinent, p. 98:

> The possible effects of a tax on oleomargarine as judged from this theoretical summary are numerous in direction as well as wide in amplitude, for a tax may cause an increase or a decrease in its price. . . . It would be rare comedy mixed with some elements of poetic justice if a tax imposed on oleomargarine brought a decrease in the prices of both butter and oleomargarine as a result.

The author of the book makes a strong case for manufacturers of oleomargarine. The sympathies of the reader will be determined chiefly by his economic outlook. A. G. HOGAN

Handbook of Microscopical Technique—*By C. E. McClung. (2nd ed.) New York: Hoeber,* 1937. 698 pp. Price, $8.00.

From time to time a modification of one of the long established technical procedures employed in the study of cells and tissues is advanced in the hope that it will prove helpful to the plant and animal physiologist to explain some of the phenomena of cell activity. While these improvements in methods are commendable, indeed desirable, they tend to broaden the scope of microscopical technic so that the technologist is gradually being forced to confine his activities within a narrow field. Many of the newer technics introduced in recent years are of a highly specialized character. To learn to what extent specialization in technology has already advanced the reader need but refer to the recent volume on this subject edited by McClung and to study the list of the contributors.

Although the second edition of *Microscopical Technique* contains almost twice the number of pages of the first edition, this increase in size is not entirely due to the addition of new material, for only about 100 pages are devoted to a description of new methods. The remainder of the added pages were necessary because the type is larger. This improves the readability of the book—an improvement which is to be commended.

Of the new methods described, the outline of the new dioxan technic is very much worth while. It is an improvement of the long used procedure employed to prepare tissues for paraffin sectioning.

Another method for studying fixed cells is the microincineration method of determining the presence and, to a limited extent, the quantity of mineral elements. While this method will undoubtedly become very useful in the future, it is as yet very little developed. It is properly presented with the author's "realization that with few exceptions they (methods employed for handling tissues) fall short of the goal histochemistry should set for itself."

One description of the new procedure has vexed the reviewer because it appears to be merely an advertisement for a new instrument. The pages devoted to the description of the centrifuge microscopic method of studying cells might have more profitably—to the technician—been given up to a description of a good method of staining Negri bodies or even spirochetes in tissues. The writer of this chapter draws the reader's attention to "A more complete account of this instrument is given in an article entitled—'The Microscope-Centrifuge and Some of its Applications'"—and, "Complete directions for the use of the centrifuge microscope are supplied with each instrument." There is not even a reference to this description in the index.

On the whole, however, the present edition of "McClung" is greatly improved due to its more lucid descrip-

tions of the more widely used methods. As a reference book it should also prove of great value whenever the need arises to employ one of the special methods.

J. A. KASPER

Autopsy, Diagnosis and Technique—*By Otto Saphir. New York: Hoeber,* 1937. 342 pp. Price, $5.00.

The book as a whole is well prepared and will undoubtedly serve as a manual of brief descriptions for rapid reference. The paging given in the table of contents for tables and illustrations does not in all cases conform with the text. In one instance such descriptive terms as "firm" and of "fluctuant consistency" are applied to the same tumor. The use of vegetables to designate size, as "pea size," is not scientific. The tables supply ready help for brief features and differential points, but, as stated in the preface, are incomplete. We do not agree with the statements that the giant cell tumors of bone do not metastasize, and that basal-cell carcinomas occur particularly at mucocutaneous junctions about the mouth, nares, ears, etc.

While many of the illustrations are more or less duplicates or copies of those found in works on pathology, this is to be expected since the autopsy technic described has been essentially a standard procedure for many years.

M. PINSON NEAL

BOOKS RECEIVED

SCHOOL NURSING. A Contribution to Health Education. By Mary Ella Chayer, R.N. Introduction by Katharine Tucker. New York: Putnam, 1937. 329 pp. Price, $3.00.

LATENT SYPHILIS—AND THE AUTONOMIC NERVOUS SYSTEM. By Griffith Evans. Baltimore: Wood, 1937. 155 pp. Price, $3.00.

DISEASES OF THE HEART. By Sir Thomas Lewis, M.D. (2nd ed.) New York: Macmillan, 1937. 297 pp. Price, $3.50.

HANDBOOK OF HYGIENE. By Joseph W. Bigger, M.D. Baltimore: Wood, 1937. 405 pp. Price, $4.00.

A DOCTOR'S ODYSSEY—A Sentimental Record of LeRoy Crummer, Physician, 1872–1934. By A. Gaylord Beaman. Baltimore: Johns Hopkins Press, 1935. 339 pp. Price, $2.50.

MILK PRODUCTS. By Wm. Clunie Harvey and H. Hill. London: H. K. Lewis Co., 1937. 387 pp. 73 ill. $5.00.

RUSSIAN MEDICINE (Cleo Medica Series). By E. Horstley Gantt. New York: Hoeber, 1937. 214 pp. Price, $2.50.

ALLERGY—ITS PRACTICAL APPLICATION. By J. A. Rudolph. Philadelphia: Dorrance, 1937. 224 pp. Price, $3.00.

YOUR DIET AND HEALTH. By Morris Fishbein, M.D. New York: McGraw-Hill, 1937. 298 pp. Price, $2.50.

AMERICAN RED CROSS FIRST AID TEXT-BOOK (rev. ed.). Philadelphia: Blakiston's, 1937. 256 pp. Paper, $.60, Cloth, $1.00.

PUBLIC HEALTH AND HYGIENE. By Charles Frederick Bolduan, M.D., and Nils W. Bolduan, M.D. (2nd ed.). Philadelphia: Saunders, 1937. Price, $2.75.

CHILD PSYCHOLOGY. By Fowler D. Brooks, in collaboration with Laurance F. Shaffer. New York: Houghton Mifflin, 1937. 600 pp. Price, $3.00.

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ELEMENTARY CHEMISTRY WITH PRACTICAL APPLICATIONS. 2d ed. By Imo P. Baughman. Philadelphia: Lea & Febiger, 1937. 296 pp. Price, $2.75.

HANDBOOK OF CHEMISTRY. 2d ed. Compiled and edited by Norbert Adolph Lange. Sandusky, O.: Handbook Publishers, 1937. 1501 pp. Price, $6.00.

THE TRAFFIC IN HEALTH. By Charles Solomon. New York: Navarre, 1937. 393 pp. Price, $2.75.

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BEAN, H., and HANKLA, E. Case Records as an Index of the Public Health Nurse's Work. Pub. Health Rep. 52, 32:1077 (Aug. 6), 1937.

More Viruses—To the long list of pathogenic viruses about which we know so little is added another group of inapparent viruses about which we know even less. Worth reading if only to give one a more wholesome respect for this difficult subject.

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The Bread of a Nation—Two British reviews of the modern conception of the place of nutrition in public health, not presenting new material, but an excellent restatement of the known.

COWELL, S. J. Outstanding Problems in Human Nutrition.

WIDDOWSON, E. M. Mineral Requirements in Human Nutrition. J. State Med. 45, 8:440 (Aug.), 1937.

Slums and Health—With slum clearance about to begin, at very long last, it behooves health administrators to bestir themselves to find out what conditions inimical to health exist and what they can do about it, so says this pointed reminder on a neglected subject.

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DALLA VALLE, J. M. Note on Comparative Tests Made with the Hatch and the Greenburg-Smith Impingers. Pub. Health Rep. 52, 33:1114 (Aug. 13), 1937.

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EVANS, A. C. Studies on Chronic Brucellosis. Pub. Health Rep. 52, 32:1072 (Aug. 6), 1937.

Social Service and Nursing—Public health nursing supervisors and executives particularly will be glad to read this review of current thinking among their colleagues. Slight shifts in social case work philosophy and practice are important to public health nursing and should stimulate self-examination within that profession.

HAMILTON, G. Basic Concepts of Social Case Work. The Family. 18, 5 (July), 1937.

Infantile Paralysis—Although there is little new in these papers on last year's poliomyelitis outbreak in Manitoba, health administrators in those American communities which are now threatened with epidemics of the disease will want to read about the findings.

JACKSON, F. W., and DONOVAN, C. R. The 1936 Epidemic of Poliomyelitis in Manitoba. Canad. Pub. Health J. 28, 30:363 (Aug.), 1937.

Diphtheria Prophylaxis — British experience with alum-precipitated toxoid confirming the satisfactory results obtained here.

SAUNDERS, J. C. Alum-Precipitated Toxoid in Diphtheria Prevention. Lancet. 1, 18: 1064 (May 1), 1937.

Is Wine a Mocker?—Moderate and sound is this brief summation of the scientific evidence and opinion on the subject of alcohol and well-being. It won't please the pros and will grieve the antis, but it should be read by all.

SPENCER, R. R. Alcohol and Health. Pub. Health News. (New Jersey Department of Health.) 21, 4:108 (Aug.), 1937.

Milk and the Law—Judicial decisions upholding health agencies in their attempt to surround the production of milk with reasonable safeguards are reported upon in this continuing summary.

TOBEY, J. A. Recent Court Decisions on Milk Control (1934–1937). Pub. Health Rep. 52, 31:1038 (July 30), 1937.

Water Resources—Reviewing, in tabular form, the rapid progress in developing American water resources. In flood control, prevention of pollution, production of water power, and supplies of potable water, tremendous strides have been made in the very recent past.

WOLMAN, A. Progress in Federal Conservation of Water Resources. 1936–1937. J. Am. W. W. Assn. 29, 7:915 (July), 1937.

ASSOCIATION NEWS

Health Conservation Contests for Syphilis and Tuberculosis

THE Chamber of Commerce of the United States and the American Public Health Association are introducing two new features into the 1937 City Health Conservation Contest.

This year, for the first time, prizes will be awarded for noteworthy achievement in the fields of tuberculosis and syphilis control.

Any city, whether it be in the regular Contest or in the Special Award Group,* is eligible for either or both the syphilis and the tuberculosis award.

These special prizes are being offered in the belief that some cities may have particularly effective programs in some special field even though their entire programs may not be of an equally high standard. Believing, however, that no city should be entitled to a special prize unless its general program is at least reasonably well balanced, any city wishing to be considered for a special prize for either syphilis or tuberculosis must submit a regular City Health Contest Fact-finding Schedule and obtain a score of at least 600 points.

To compete for these awards a city must fill out the questionnaire for syphilis or tuberculosis and submit such additional information as it feels will be helpful in evaluating its program.

The syphilis or tuberculosis questionnaires must be forwarded to the United States Chamber of Commerce at the same time the regular fact-finding schedule is submitted.

Entry blanks for the Health Conservation Contests for Syphilis and Tuberculosis may be obtained from either the American Public Health Association or the Chamber of Commerce of the United States.

The syphilis and/or tuberculosis questionnaires will be forwarded upon receipt of a filled out entry blank.

If recognition for an outstanding program in tuberculosis or syphilis control is awarded to a city in the Special Award Group,* additional similar recognition will also be given to a city in the regular Contest, providing there is a city in the regular Contest fully entitled to such recognition.

For further particulars concerning the tuberculosis and syphilis awards, write to the American Public Health Association, 50 West 50th Street, New York, N. Y.

* Special Award Cities are those cities which have obtained first awards in the City Contest for two or more years and are barred from competition in the regular contest.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Ervin J. Brenner, M.D., Manistique, Mich., Director, Alger-Schoolcraft Health Dept.

George F. Brockman, M.D., Shepherdsville, Ky., Director, Bullitt County Health Dept.

Charles Daligny, M.D., Bank Bldg., Troy, N. C., Montgomery County Physician

Preston H. Edwards, Jr., M.D., Conway, S. C., Horry County Health Officer

Frank S. Fellows, M.D., State Board of

Health, Raleigh, N. C., U. S. Public Health Service Venereal Disease Consultant

John T. Hairston, M.D., 414 Medical Arts Bldg., San Antonio, Tex., Secretary, City Board of Health

James Heydanek, M.D., 1725 S. Racine Ave., Chicago, Ill., District Health Superintendent, State Dept. of Public Health

John B. Jones, M.D., Charleston, Mo., Health Officer, Scott and Mississippi Counties

Lawrence R. McCormack, M.D., Pikeville, Ky., Pike County Health Officer

Nathaniel A. Mercer, M.D., M.P.H., Paull Bldg., Columbia, Ky., County Health Officer

W. R. Parker, M.D., Jackson, N. C., Northampton County Health Officer

Donald W. Patrick, M.D., U. S. Leprosy Investigation Station, Honolulu, T. H., Passed Assistant Surgeon, U. S. Public Health Service

Fray O. Pearson, M.D., C.P.H., Livingston, Tenn., Health Officer, Upper Cumberland District

Roy C. Rehder, M.D., City Bldg., Mansfield, O., Health Officer, Mansfield and Richland Counties

Oscar L. Rogers, M.D., Sandersville, Ga., Washington County Commissioner of Health

Raymond F. Sheets, M.D., 117 W. Main St., Carthage, Ill., District Health Superintendent, State Dept. of Public Health

David O. Thompson, M.D., 319 W. Elm St., Sycamore, Ill., District Health Superintendent, State Dept. of Public Health

C. W. Vaughn, M.D., 122½ W. State St., Nokomis, Ill., District Health Superintendent, State Dept. of Public Health

Sidney J. Williams, M.D., C.P.H., Livingston, Ala., Sumter County Health Officer

Robert D. Wright, M.D., State Dept. of Health, Jefferson City, Mo., Director, Venereal Disease Control

Laboratory Section

Frances Angela, State Dept. of Public Health, Chicago, Ill., Senior Bacteriologist

Otto P. Behrer, City Hall, Cincinnati, O., Director of Laboratory, Board of Health

Anna E. Dickson, 4351 Southern Parkway, Louisville, Ky., Assistant Director, Bureau of Laboratories, State Dept. of Health

Margaret Dickson, U. S. Marine Hospital, Louisville, Ky., Medical Technician

Alice C. Evans, National Institute of Health, Washington, D. C., Senior Bacteriologist

Dominique Gauvin, D.Sc., City Hall, Quebec, Que., Canada, Chief City Analyst, Municipal Laboratory

Mildred E. Griffin, U. S. Marine Hospital, Stapleton, N. Y., Laboratory Technician

Marvin M. Harris, Ph.D., State Dept. of Health, Atlanta, Ga., Bacteriologist

Regina W. Kahn, 510 State St., Brooklyn, N. Y., Technician, Peekskill Hospital

William E. Kelly, M.D., State Hospital, Middletown, N. Y., Pathologist

David Levowitz, Ph.D., 226 Easton Ave., New Brunswick, N. J., Director, New Jersey Dairy Laboratories

Herman C. Mason, 1517 S. Drake Ave., Chicago, Ill., Instructor, Bacteriology and Public Health, University of Illinois, College of Medicine

Magnhild Oygard, Box 528, Juneau, Alaska, Laboratory Technician, Territorial Dept., of Health

John T. Tripp, Ph.D., Michigan Dept. of Health, Lansing, Mich., Physiological Chemist

Delvina A. Villier, 3628 Western Parkway, Louisville, Ky., Supervising Technician, State Dept. of Health

William G. Workman, M.D., National Institute of Health, Washington, D. C., Passed Assistant Surgeon, U. S. Public Health Service

Vital Statistics Section

Muriel F. Kimmey, 353 Ocean Ave., Brooklyn, N. Y., Health Statistician, New York City Dept. of Health, Committee on Neighborhood Health Development

Constance Lebair, 15 Washington Ave., Cedarhurst, N. Y., Vital Statistician, New York City Dept. of Health, Committee on Neighborhood Health Development

John B. Nichols, M.D., 51 Louisiana Ave., Washington, D. C., Medical Director, Acacia Mutual Life Insurance Co.

Jacob Yerushalmy, Ph.D., 549 Mercer St., Albany, N. Y., Assistant Statistician, State Dept. of Health

Peter J. Zisch, 409 Bradley Bldg., 623 N. Water St., Milwaukee, Wis., President, National Association of Coroners

Public Health Engineering Section

Don E. Bloodgood, C.E., R.F.D. 3, Box 976H, Indianapolis, Ind., Sanitary Engineer, Board of Public Works and Sanitation

Roy J. Boston, 6 Hardeman Bldg., Macon, Ga., Assistant Engineer, State Dept. of Public Health

C. Norman Dold, 6 E. Lake St., Chicago, Ill., General Manager, Rose Exterminator Co.

J. Andre Fouilhoux, 45 Rockefeller Plaza, New York, N. Y., Architect (Member, Committee on the Hygiene of Housing)

Irving F. Gaskin, Erin-Siparia, Trinidad,

B.W.I., Sanitary Inspector, Public Health Dept.

Everett C. Handorf, 521 S. Mill St., Lexington, Ky., Fayette County Sanitary Engineer

James D. Hanson, Farmington, Me., District Sanitary Engineer, Cooperative Health Unit

Douglas B. Morton, 1753 S. Fourth St., Springfield, Ill., Assistant Milk Sanitarian, State Dept. of Public Health

Roy W. Swope, C.E., 4416 Francis St., Kansas City, Kans., City Sanitary Engineer

Industrial Hygiene Section

Hiram J. Bush, M.D., 3640 Marine Ave., St. Louis, Mo., Passed Assistant Surgeon, U. S. Public Health Service, U. S. Marine Hospital

Food and Nutrition Section

Emilio Domingo, 511 W. 139 St., New York, N. Y., Inspector of Foods, New York City Dept. of Health

John F. Johnston, Health Dept., Newport, R. I., Supervising Inspector, Division of Milk Inspection

Samuel Rosenstock, 211 Smith St., Brooklyn, N. Y., Inspector of Foods, New York City Dept. of Health

Child Hygiene Section

Florence A. Browne, M.D., 130 E. 22 St., New York, N. Y., Pediatrician, Child Welfare League of America, Inc.

Edwin F. Daily, M.D., U. S. Children's Bureau, Washington, D. C., Director, Division of Maternal and Child Health

Henry Klein, D.D.S., Sc.D., U. S. Public Health Service, Washington, D. C., Associate Pharmacologist

John W. Knutson, D.D.S., U. S. Public Health Service, Washington, D. C., P. A. Dental Surgeon

Thomas W. Nale, M.D., State Dept. of Health, Charleston, W. Va., Assistant Director, Maternal and Child Hygiene

Malvin J. Nydahl, M.D., 305 City Hall, Minneapolis, Minn., Director, Hygiene and Health Education, Board of Education

Irene J. Parrott, 11 E. 55 St., New York, N. Y., Editor, Baby Talk magazine

Public Health Education Section

Benjamin U. Baker, 4525 Broadway, Chicago, Ill., Secretary-Treasurer, Exterminator Engineering Corp.

Robert H. Beverly, M.D., 210½ S. Fifth St., Springfield, Ill., District Health Superintendent, State Dept. of Public Health

Harriet E. Chalmers, M.D., 45 Walnut St., New Britain, Conn., School Physician

Essie L. Elliott, Calif. Fruit Growers Exchange, Los Angeles, Calif., Director, Home Economics and Health Education

Greta Gray, Ph.D., 1507–11 St., Santa Monica, Calif., Associate Professor, Sanitation and Housing, University of California at Los Angeles

Joseph D. Heacock, M.D., 2021–6 Ave., Birmingham, Ala., Medical Director, Protective Life Insurance Co.

John J. Lentz, Jr., 240 E. 22 St., New York, N. Y., Health Education, Metropolitan Life Insurance Co.

Wilbur J. Myers, 503 Washington Apts., Lansing, Mich., Charge of Publications, State Dept. of Health

Esther G. Price, 45 Pondfield Rd. W., Bronxville, N. Y., Special Writer, School Health Bureau, Metropolitan Life Insurance Co.

Berthold T. D. Schwarz, M.D., 26 Park St., Montclair, N. J., Medical Director, Bankers National Life Insurance Co.

Thomas C. Stowell, 56 Spring St., Albany, N. Y., Assistant Director, Public Health Education, State Dept. of Public Health

Annie J. Taylor, State Dept. of Public Health, Atlanta, Ga., Educational Director, Division of Dental Health Education

James G. Williams, D.D.S., 1003 Medical Arts Bldg., Atlanta, Ga., Dental Consultant, Division of Dental Health Education, State Dept. of Public Health

Public Health Nursing Section

Ozetta M. Byllesby, R.N., 2310 Hilton Ave., Ashland, Ky., Supervisor of Nurses, Boyd County Health Dept.

Ann W. Dinegan, 1 Beacon St., Boston, Mass., Consultant in Public Health Nursing Education, State Dept. of Public Health

Kathleen Genusa, R.N., 1235 Poplar St., Helena, Ark., County Health Nurse, Phillips County Health Unit

Agnes M. Halloran, R.N., 305 N. Walnut St., Bay City, Mich., Nurse, Bay County Health Dept.

Oma B. Hunter, 508 W. 10th, Topeka, Kans., Nurse, Dept. of Health

Mary E. Redmond, 404 King St., Bay City, Mich., Director, Public Health Nursing Service

Fannie T. Warncke, State Dept. of Public Health, Santa Fe, N. Mex., Director, Public Health Nursing

Fleta M. Wilson, 1033 Cleveland, Kansas City, Kans., Nurse, Dept. of Health

Epidemiology Section

Robert Dyer, M.D., C.P.H., State Dept. of Health, Albany, N. Y., Medical Consultant, Bureau of Pneumonia Control

Donald S. Fleming, M.D., Hillsdale County

Health Dept., Hillsdale, Mich., Fellow in Rural Health Admr., W. K. Kellogg Foundation

Edward F. Hartung, M.D., 115 E. 61 St., New York, N. Y., Interested in furthering study of Chronic Diseases

Carl Lovelace, M.D., Amicable Bldg., Waco, Tex., Medical Director, Amicable Life Insurance Co.

Joseph G. Molner, M.D., C.P.H., Detroit Dept. of Health, Detroit, Mich., Associate Epidemiologist

David D. Rutstein, M.D., 7 Euclid Ave., Albany, N. Y., Medical Consultant, Bureau of Pneumonia Control, State Dept. of Health

Arthur G. Schoch, M.D., Preston Downs, Dallas, Tex., Director, Syphilis and Venereal Disease Clinic

Phineas J. Sparer, M.D., C.P.H., 1900 E. Madison St., Baltimore, Md., Director, Bureau of Tuberculosis, Department of Health

Unaffiliated

Pierre Boucher, 10 St. James St., W., Montreal, P. Que., Canada, Secretary, Dept. of Planning and Research, Montreal Metropolitan Commission

Orville H. Brown, M.D., Ph.D., 711 Professional Bldg., Phoenix, Ariz., Library Chairman, Maricopa County Medical Society

Raimundo de Castro, M.D., Calle B 150 entre 15 y 17, Vedado, Habana, Cuba, Director of Anthropology, Legal Medicine and Toxicology Sections, Finlay Institute

Virgil J. Dorset, M.D., National Institute of Health, Washington, D. C., Assistant Surgeon, U. S. Public Health Service

Frank Harnden, M.D., 7 North St., Pittsfield, Mass., Medical Director, Berkshire Life Insurance Co.

David R. Iriarte, M.D., Clinica Razetti, Caracas, Venezuela, S. A., Otorinolaringologo, Servicio Escolar, Sanidad Nacional

Richard C. Leonard, D.D.S., 2411 N. Charles St., Baltimore, Md., Chief, Division of Oral Hygiene, State Dept. of Health

John N. McDonnell, D.Sc., 409 Old York Rd., Jenkintown, Pa., Assistant Professor in Pharmacy, Philadelphia College of Pharmacy and Science

James F. Owen, D.D.S., 912 First National Bank Bldg., Lexington, Ky., Director, Bureau of Dental Health, State Dept. of Health

Arthur W. Peacock, D.V.M., 172 Park Ave., Watertown, N. Y., Senior Milk Sanitarian, State Dept. of Health

Alfred Walker, D.D.S., 501 Madison Ave., New York, N. Y., Chairman, Dental Committee, New York Diabetic Assn.

NEWS FROM THE FIELD

NATIONAL INSTITUTE OF HEALTH TO ERECT NEW BUILDINGS

PLANS for the construction of three new buildings to provide better facilities for the National Institute of Health, Washington, D. C., have been announced.

The buildings will be erected on a 45 acre tract of wooded land 1½ miles beyond Bethesda, Md., on the Rockville highway. The property was donated to the U. S. Public Health Service for this purpose in 1935 by the late Luke I. Wilson, of Washington. A total allotment of $1,143,000 from the emergency construction program acts of 1934 and 1936 is available for construction.

The National Cancer Institute, recently authorized by Congress, probably will be built on the same tract of land and its work coördinated with that of the National Institute of Health. . . . —*Science*, September 3, 1937, p. 216.

SCARLET FEVER TOXIN

SOME interesting facts resulting from his extensive studies of purified and precipitated scarlet fever streptococcus toxin for active immunization are presented by Surgeon Milton V. Veldee, of the U. S. Public Health Service. He finds that the method of manufacturing the toxin is practicable, and the use of the intradermal method of making the immunizing injections has been shown to possess definite advantages over deeper injections. The use of 790, 3,000, and 10,000 skin-test doses, respectively, has given an acceptable percentage of Dick negative children and has proved satisfactory as to the relative freedom from objectionable reactions. Nevertheless, Dr. Veldee states, it will require a lapse of time in the present study and trial immunizations in communities other than those covered before final conclusions can be drawn as to the adequacy of the method and the necessary dosage.—*The Health Officer*, Sept., 1937, p. 185.

MILITARY SURGEONS CONVENTION

THE Convention of the Association of Military Surgeons will be held at the Ambassador Hotel, Los Angeles, Calif., on October 14–16.

The Pacific Fleet will be in port during the Convention, and an unusually interesting program has been prepared. Physicians, Surgeons, Dentists, and Veterinarians of the Army, Navy, Marine Corps, CCC Camps and the Veterans' Administration will be present.

NEW YORK EMERGENCY RELIEF MERGED WITH STATE AGENCY

THE Temporary Emergency Relief Administration, created in 1931 by the state legislature to provide for the unprecedented relief needs then existing was merged July 1 with the New York State Department of Social Welfare. Many members of the staff of TERA have been added to the staff of the State Department, but many positions have been discontinued.

Local units are allowed to continue the Emergency Relief machinery for a year if they so desire.

PNEUMONIA-VENEREAL DISEASE STUDIES

A COMMISSION has been appointed by the Medical Society of the State of Pennsylvania, Erie, Pa., for the study of pneumonia control. A commission has also been appointed on the control of syphilis and venereal diseases.

OKLAHOMA HEALTH DEPARTMENT IN NEW QUARTERS

THE Oklahoma State Department of Health recently moved its headquarters in Oklahoma City from the State Capitol to a building formerly used as a soldiers' home. The move was made when increased appropriations and federal funds made possible enlarged activities for the Health Department.

There are now 8 bureaus and it is anticipated that the department will have about 300 employees when the program is fully launched; 21 counties in the state now have full-time health units under the general supervision of Dr. Charles E. Leonard. Dr. Charles M. Pearce is the Health Commissioner.

PELLAGRA SURVEY

FOUR northern counties of Arkansas have been selected as the area for a survey of pellagra now being conducted by the Public Health Service in coöperation with the American Red Cross.

An attempt will be made to establish the relationship between pellagra and floods in the 4 counties, over which the Mississippi River flowed during the past winter.

CAPPS PRIZE

THE Institute of Medicine of Chicago offers the Joseph A. Capps Prize of $500 for the most meritorious investigation in medicine or in the specialities of medicine. The investigation may be also in the fundamental sciences, provided the work has a definite bearing on some medical problem.

Competition is open to graduates of Chicago medical schools who completed their internship in 1935 or who completed one year of laboratory work in 1936. The winner of the prize will be expected to present the results of his investigation before the Institute at some meeting in 1938, the time to be designated later. Manuscripts must be submitted to the Secretary of the Institute, 86 East Randolph Street, Chicago, Ill., not later than December 31, 1937.

NEW YORK CANCER COMMISSION APPOINTED

MEMBERS of a Commission authorized by the recent session of the legislature to survey the prevalence of cancer in the State of New York and facilities for treatment were recently announced. Six members of the legislature were appointed by officials of that body, and the following physicians were named by Governor Lehman:

Edward S. Godfrey, Jr., M.D.—State Health Commissioner, Albany.

James Ewing, M.D.—Director of Cancer Research, Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York.

Floyd S. Winslow, M.D.—Rochester (Immediate Past-President of the Medical Society of the State of New York).

The Commission has an appropriation of $15,000 and will report to the 1938 legislature.

MICHIGAN ASSOCIATION

THE Michigan Public Health Association will hold its next meeting at Lansing, November 10–12.

NEW MEXICO ASSOCIATION

THE next meeting of the New Mexico Public Health Association will be held in Albuquerque, N. M., November 18–19.

TEXAS ASSOCIATION

THE Texas Public Health Association will hold its next meeting at Dallas, Tex., November 1–3, at the Adolphus Hotel.

WEST VIRGINIA ASSOCIATION

THE West Virginia Public Health Association will hold its next meeting at Charleston, W. Va., November 8–10.

PERSONALS

Central States

LEWIS S. BARGER, M.D.,† of Golconda, has been appointed Superintendent of the new health unit including Alexander, Hardin, Johnson, Massac, Pope, Pulaski, and Union Counties, Ill.

DR. EARL R. BEIDERWELL, of Belleville, Kans., has been appointed Health Officer of Republic County.

DR. RICHARD F. BOYD, of Cimarron, Kans., has been appointed Health Officer of Gray County.

DR. PAUL A. BREHM,† of Milwaukee, Wis., has been placed in charge of an Industrial Hygiene program initiated under the terms of the Social Security Act.

DR. ERVIN J. BRENNER,† of East Jordan, Mich., has been appointed Health Officer of the newly organized Alger-Schoolcraft County Health Department. Headquarters are in Manistique, Mich., with a branch office in Munising.

DR. FRANK O. BRUNCKHORST has been appointed Health Officer of Neenah, Wis., succeeding DR. BRYCE K. OZANNE, resigned.

JOSEPH L. BRYAN, M.D.,† of Xenia, has been appointed Superintendent of the new health unit including Clay, Edwards, Jefferson, Marion, Wabash, and Wayne Counties, Ill.

DR. FRANK E. BUNTING, of Mandan, N. D., has recently been appointed Health Officer of Morton County.

GUY G. CAMPBELL, M.D.,† of East Gary, Ind., has been appointed head of the medical staff of the Firestone Plantation, Liberia, Africa.

ROLAND R. CROSS, M.D.,† of Dahlgren, has been appointed Superintendent of the new health unit including Franklin, Gallatin, Hamilton, Saline, White, and Williamson Counties, Ill.

DR. FREDERICK E. DARGATZ, of Kinsley, Kans., has been appointed Health Officer of Edwards County.

NETTIE A. M. DORRIS, M.D.,† of Paris, Ill., has been appointed Superintendent of the new health unit including Champaign, Coles, Douglas, Edgar, and Vermilion Counties, Ill.

DR. SPENCER B. DYKES, of Esbon, Kans., has been appointed Health Officer of Jewell County.

DR. HAROLD H. FECHTNER, of Wausau, Wis., has resigned as Director of the Marathon County Health Unit.

DR. CLINTON C. FULLER, Columbus, Kans., has been appointed Health Officer of Cherokee County.

JOHN E. GORDON, M.D., PH.D.,† of Chicago, now Field Director of the International Health Division of the Rockefeller Foundation, has been appointed Professor of Preventive Medicine and Epidemiology at the Harvard Medical School.

DR. CLAUD E. HARDIN, of Oswego, Kans., has been appointed Health Officer of Labette County, succeeding DR. ONNIE E. STEVENSON, who has resigned to become Assistant Superintendent of the State Hospital at Parsons. Dr. Stevenson was Health Officer 12 years.

FRANCIS E. HARRINGTON, M.D.,† Health Commissioner of Minneapolis, Minn., and Director of Hygiene of Minneapolis Schools, has been appointed a member of the Hennepin County Sanatorium Commission, succeeding DR. SOLON MARX WHITE.

FRED P. HELM, M.D., Health Officer of Topeka, Kans., has been appointed Secretary and Executive Officer of the Kansas State Board of Health,

* Fellow A.P.H.A.
† Member A.P.H.A.

succeeding EARLE G. BROWN, M.D.,* resigned, who became Health Officer of Arlington, Va.

SANDOR HORWITZ, M.D.,* of Peoria, has been appointed Superintendent of the new health unit including Marshall, Peoria, Putnam, Stark, Tazewell, and Woodford Counties, Ill.

DR. EDWIN M. IRELAND, of Coats, has been appointed Health Officer of Pratt County, Kans.

DR. WILLIS L. JACOBUS, of Ottawa, Kans., has been appointed Health Officer of Franklin County.

FRANK J. JIRKA, M.D.,† has resigned as Health Commissioner of Illinois, effective September 1.

LORIN KERR, JR., of Toledo, Ohio, has been appointed head of the Bureau of Medical Relief and Superintendent of the Municipal Hospital for Contagious Diseases in Toledo.

DR. GEORGE R. LEE, of Yates Center, has been appointed Health Officer of Woodson County, Kans.

DR. CHARLES K. MCCARTHY has been appointed Director of Activities for the Control and Prevention of Tuberculosis, to be carried on by the State Medical Society, Iowa Tuberculosis Association, and the Iowa State Department of Health.

DR. ERNEST C. MOSER, of Holton, Kans., has been appointed Health Officer of Jackson County.

DR. ROSCOE T. NICHOLS, of Hiawatha, Kans., has been appointed a member of the Kansas State Board of Health, to succeed DR. CHARLES W. ROBINSON, of Atchison, resigned.

MALVIN NYDAHL, M.D.,† has been appointed Assistant Director of Hygiene of Minneapolis Schools.

LORAN E. ORR, M.D.,† of Greenview, has been appointed Superintendent of the new health unit, including Cass, Logan, Mason, Menard, and Sangamon Counties, Ill.

DR. LEROY S. S. OTT, of Leoti, has been appointed Health Officer of Wichita County, Kans.

CARL A. PETERSON, M.D.,† of Moline, has been appointed Superintendent of the new health unit including Bureau, Henry, Mercer, Rock Island, and Whiteside Counties, Ill.

JAMES A. POLING, M.D.,† of Freeport, has been appointed Superintendent of the new health unit including Stephenson, Carroll, Jo Daviess, Lee, and Ogle Counties, Ill.

JOHN W. H. POLLARD, M.D.,† Health Commissioner of Evanston, Ill., for 11 years, has resigned, effective September 1.

EDWARD C. ROSENOW, M.D.,† Professor of Experimental Bacteriology, Graduate School of the University of Minnesota, Mayo Foundation, Rochester, Minn., has been given the James E. Stacey award, consisting of a gold medal and $100.

DR. LLOYD H. SARCHET, of Wellington, Kans., has been appointed Health Officer of Sumner County.

JAMES P. SHARON, M.D.,† of Fort Dodge, Iowa, has been appointed Associate Director in Charge of Venereal Disease Control, Division of Preventable Diseases, Iowa State Department of Health, effective July 1.

MILTON L. SHURR † has been appointed Secretary of the Health Division and the Health Council of the Omaha Council of Social Agencies, Omaha, Neb.

DR. LESTER J. SPINHARNEY has been appointed Health Officer of Cherokee, Ia., succeeding the late DR. CHARLES F. QUINN. Dr. Spinharney held the post from 1927 to 1931.

DR. EDGAR M. SUTTON, of Salina, Kans., has been appointed Health Officer of Saline County.

DR. JOHN G. SWAILS, of Wathena,

* Fellow A.P.H.A.
† Member A.P.H.A.

Kans., has been appointed Health Officer of Doniphan County.

WINSTON H. TUCKER, M.D.,† coördinating Epidemiologist, Illinois State Department of Health, Springfield, Ill., has been appointed Health Officer of Evanston, succeeding JOHN W. H. POLLARD, M.D.,† resigned.

DR. OTIS H. TRUE, of Bird City, has been appointed Health Officer of Cheyenne County, Kans.

W. CLARENCE VAN WORMER, M.D.,† of Homewood, has been appointed Superintendent of the new health unit including Cook, DuPage, and Will Counties, Ill.

DR. HOMER S. WEST, of St. Clairsville, Ohio, has been appointed Health Officer of Belmont County, succeeding DR. ARCHIE J. MARTIN, resigned.

DR. MERLE L. WHITNEY, of Virgil, Kans., has been appointed Health Officer of Greenwood County.

DR. WILLIAM L. WILMOTH, of Blue Rapids, Kans., has been appointed Health Officer of Marshall County.

Eastern States

DR. JAMES ROWLAND ANGELL, retiring President of Yale University, has accepted a full-time position as Educational Counselor of the National Broadcasting Company.

STANHOPE BAYNE-JONES, M.D.,† Dean and Professor of Bacteriology, Yale University School of Medicine, New Haven, Conn., has been elected a member of the Medical Advisory Board of the Leonard Wood Memorial (American Leprosy Foundation).

DR. ERNEST A. CHARON, of Manville, R. I., has been appointed Health Officer of Lincoln, succeeding the late DR. HARRY A. MANCHESTER.

DR. WALTER CLARKE † has been appointed Executive Director of the American Social Hygiene Association, effective July 1. DR. WILLIAM F. SNOW, M.D.,* continues as General Director of the Association. Dr. Clarke in 1935 was loaned by the Association to the New York City Department of Health to organize and direct its Bureau of Social Hygiene. His successor in the Bureau as Director is THEODORE ROSENTHAL, M.D.,† of New York City.

FRANCIS V. CORRIGAN, M.D.,† of Providence, R. I., Assistant Chief of the Bureau of Child Hygiene in the Rhode Island State Department of Health for the past 16 months, has been appointed Chief, succeeding MARION A. GLEASON, M.D.,† who retired after 14 years' service.

JAMES A. DOLCE, M.D.,† Medical Inspector of the Glen Head, L. I., N. Y., schools, has been named Associate Field Director and Health Officer of Allegan County, Mich., under a fellowship from the Kellogg Foundation.

LIVINGSTON FARRAND, M.D.,* retiring President of Cornell University, formerly Professor of Anthropology at Columbia University, has had the title of President-Emeritus conferred upon him by the Board of Trustees of Cornell University.

DR. SIMON J. GORMLEY, of Albany, N. Y., has been appointed an Epidemiologist-in-Training with the State Department of Health.

IRA V. HISCOCK, C.P.H.,* Professor of Public Health, Yale University School of Medicine, New Haven, Conn., is conducting a study of public and private health agencies of Colorado Springs and El Paso County, Colo. He was invited to make the survey by the Community Chest, with a view to recommending a more adequate health service.

DR. EDWARD P. KEMP has been appointed Health Officer of Fairfield,

* Fellow A.P.H.A.
† Member A.P.H.A.

Conn., for the unexpired term of LAURENCE E. POOLE, M.D.,* resigned.

DR. FRANCIS I. NETTLETON has been appointed Health Officer of Shelton, Conn.

DR. MICHAEL J. O'NEIL, of Providence, R. I., has been appointed Medical Director of the Rhode Island State Unemployment Relief Commission, succeeding DR. HENRY J. HOYE.

M. L. PALMIERI, M.D., M.P.H., has been elected as the first full-time health officer of Middletown, Conn.

DR. DAVID D. RUTSTEIN, of Boston, N. Y., has been appointed full-time Medical Consultant in Pneumonia Control on the staff of the New York State Department of Health.

DR. RALPH M. VINCENT, of Maine, N. Y., has been appointed Epidemiologist-in-Training on the staff of the New York State Department of Health.

Southern States

DR. JAMES L. ADAMS, of Hobart, Okla., has been appointed Health Superintendent of Kiowa County.

DAVID H. ANDREW, M.D., formerly Health Officer of Wythe County, Wytheville, Va., has been appointed Director of the Bureau of Communicable Diseases in the Baltimore Health Department (Maryland), effective June 28, succeeding ADOLPH WEINZIRL, M.D.,† who is now Health Officer of Portland, Ore.

DR. GLENN J. BRIDGES, of Atlanta, has been appointed Health Officer of Jenkins County, Ga., succeeding DR. HUGH B. SENN, of Millen, resigned.

EARLE G. BROWN, M.D.,* has been appointed Health Officer of Arlington County, Va.

JOHN W. BROWN, M.D.,* of Austin, Tex., State Health Officer, has been appointed Health Officer of Houston.

DR. DONALD L. BUTTERFIELD, of Moundsville, W. Va., has been appointed Medical Adviser of the West Virginia State Department of Public Assistance. He will have charge of work with crippled children, adult physical rehabilitation, and emergency medical and hospital care of the Department's relief load.

DR. ARCHIE S. CALHOUN, of Mount Olive, Miss., has been appointed Health Officer of Covington County, succeeding DR. GEORGE T. CRANFORD, of Seminary.

EVERETT E. CARRIER, M.D.,† of Johnson City, Tenn., Assistant Health Officer of Washington County since 1934, has been appointed Health Officer, to succeed WALLACE L. POOLE, M.D., M.P.H.,† resigned. DR. JOSEPH L. CONYERS, of Gates, has been appointed Assistant to Dr. Carrier.

DR. WARREN DALLAS CARTER, of Wilmington, N. C., has been appointed Health Officer of Burke and Caldwell Counties, to supervise units recently established in the two counties.

TURNER E. CATO, M.D.,† of New Cumberland, W. Va., former Health Officer of Hancock County, has been appointed Health Officer of Kanawha County, with headquarters in Charleston.

DR. ROBERT M. CHURCH, of Stilwell, Okla., has been appointed Health Superintendent of Adair County, Okla.

DR. THOMAS W. COLLIER, of College Park, Ga., has been appointed Health Officer of Dougherty County.

LINWOOD FARLEY, M.D.,† recently Health Officer of Hanover County, Va., has been appointed Assistant Health Officer of the Valley Health District, Va.

LEON PAUL FORGRAVE, M.D., of St. Joseph, Mo., has been appointed a member of the State Board of Health, succeeding WILLIAM T. ELAM, M.D.,

* Fellow A.P.H.A.
† Member A.P.H.A.

of St. Joseph, whose term recently expired.

DR. BENJAMIN FREEDMAN, of New Orleans, La., has been appointed in charge of the Washington Parish Health Unit.

DR. JACK E. FROST, of DeKalb, Tex., has been appointed Health Officer of Bowie County.

DR. HARRY B. HALL, of Boise City, has been appointed Health Superintendent of Cimarron County, Okla.

DR. RALF HANKS, of Fulton, Mo., was recently elected President of the Missouri Association for Mental Hygiene.

WILLIAM P. HARRISON, M.D., of Teague, Tex., was recently elected President of the Texas State Board of Health, succeeding ELBERT W. WRIGHT, M.D.,† of Bowie.

DR. WILLIAM C. HUMPHRIES has resigned as Health Officer of the City of Griffin, and Spalding County, Ga.

DR. ROBERT H. JOHNSON, of Clarksville, Ark., has been appointed Health Officer of Johnson County, Ark.

DR. PHILIP S. JOSEPH, of Alice, Tex., has been reëlected Health Officer of Jim Wells County.

DR. WEBSTER B. KEY, of Memphis, Tenn., has been appointed to the Tennessee State Public Health Council, to succeed DR. JOHN C. AYRES, of Memphis, resigned.

DR. RALPH A. KINSELLA, of St. Louis, Mo., has been appointed a member of the City Plan Commission.

GEORGE MCLEAN LAWSON, M.D.,† recently Professor of Public Health and Bacteriology at the University of Louisville, Ky., School of Medicine, has been appointed Professor of Preventive Medicine and Bacteriology at the University of Virginia Department of Medicine, Charlottesville, Va.

DR. SIGMA V. LEWIS, of Roxboro, N. C., has been appointed Health Officer of a district including Washington, Tyrrell, and Hyde Counties.

DR. JAMES T. LOWE, of Mangum, Okla., has been appointed Health Officer of Greer County.

DR. HUGH B. MAGILL, JR., formerly of Northampton County, has been named Health Officer of Hanover County, Va., with headquarters at Ashland.

DR. KARL E. MANEVAL, of Mexico, has been appointed Health Officer of Audrain County, Mo., succeeding the late DR. ROBERT W. BERRY.

DR. CARL T. MARTIN, of Abbeville, has been appointed Health Officer of Henry County, Ala., succeeding DR. WALLACE L. CHAMBERS, resigned.

DR. GLEN W. MCDONALD, of Ada, Okla., has been appointed Health Officer of Pontotoc County.

DR. BENJAMIN C. MIDDLETON, of Texarkana, Ark., has been appointed Health Officer of Miller County.

DR. ZACK P. MITCHELL, of Bryson City, N. C., recently Assistant Health Officer of Swain County, has been appointed Health Officer of a district comprised of Cherokee, Clay, and Graham Counties.

DR. GEORGE E. NEWTON, of Scottsboro, Ala., Health Officer of Jackson County, has been appointed Health Officer of Lauderdale County, succeeding the late DR. WILDER D. HUBBARD, of Florence.

DR. EDWARD C. O'CAIN, of Winona, Miss., has been appointed Health Officer of Montgomery County, succeeding DR. JAMES P. SYNNOTT.

DR. PHILIP G. PADGETT, of Forest City, N. C., has been appointed Assistant Health Officer of Swain County, succeeding DR. ZACK P. MITCHELL.

DR. WALTER R. PARKER,† of Woodland, N. C., has been appointed Health Officer of Northampton County, Va.

* Fellow A.P.H.A.
† Member A.P.H.A.

THOMAS PARRAN, M.D.,* President of the A.P.H.A., and Surgeon General of the U. S. Public Health Service, had conferred on him the Honorary Degree of Doctor of Science by Wesleyan University, Middletown, Conn., on June 20.

DR. FRAY O. PEARSON, of Knoxville, Tenn., has been appointed Director of the Upper Cumberland Health Unit, comprising Fentress, Pickett, Clay, Overton, and Jackson Counties.

DR. EDWARD W. PILLSTROM has been appointed Health Officer of Coal Hill, Ark.

HERBERT F. READLING, M.D.,† of Durham, N. C., has been appointed Health Officer of the Thomas County, Ga., Health Department, succeeding DR. JAMES R. DYKES, resigned.

DR. JESSE E. ROSS, JR., of Henderson, Tex., has been named Health Officer of Rusk County.

DR. CHARLES N. SCOTT, of Alloy, W. Va., has been appointed head of the Bureau of Venereal Diseases in the West Virginia State Department of Health.

DR. WYMAN P. STARLING, of Clinton, N. C., has resigned as Health Officer of Sampson County, to enter private practice.

DR. JOSEPH B. THIGPEN, of Bay Springs, Miss., has been appointed Health Officer of Jasper County, effective July 1.

DR. WALTER E. VEST, of Huntington, W. Va., was elected President of the Public Health Council of West Virginia at a meeting in Fairmont in July.

DR. WILLIAM H. WALCOTT, of Chatham, Va., has resigned as Health Officer of Pittsylvania County, to accept a position on the staff of the U. S. Public Health Service in Washington, D. C. His successor is DR. BENJAMIN R. ALLEN, of Luray, Va.

DR. CYRIL A. WALWYN, Assistant Director of the Health Service of Howard University, Washington, D. C., has been appointed Medical Director of the John A. Andrew Memorial Hospital and head of the Health Department of Tuskegee Institute, Tuskegee, Ala. He succeeds DR. EUGENE H. DIBBLE, JR., who recently was appointed manager of the Veterans' Administration Facility at Tuskegee.

VIRGINIA E. WEBB, M.D.,† who was temporarily in charge of the Washington Parish Health Unit, New Orleans, La., has returned to her work in the maternal and child health unit in New Orleans.

DR. JABEZ H. WILLIAMS, formerly of the staff of the State Sanatorium, Sanatorium, N. C., has been appointed Health Officer of Sampson County, to succeed DR. WYMAN P. STARLING, of Clinton.

DR. MILTON C. WILLIAMS, of San Marcos, Tex., has been appointed Health Officer of Hays County.

DR. C. C. WITT, of Arcadia, Fla., has been appointed Supervisor of District No. 2 of the State Health Department, with headquarters at Lake City.

Western States

DR. JOHN W. ADAMS, of Waterville, Wash., has resigned as Health Officer of Douglas County.

WELBY W. BIGELOW, M.D., has been appointed to have charge of the Northern District of the new public health unit established in Utah, with headquarters in Salt Lake City.

J. ROSSLYN EARP, DR.P.H.,* formerly Director of Public Health for the State of New Mexico, has been appointed Medical Editor in the Division of Public Health Educa-

* Fellow A.P.H.A.
† Member A.P.H.A.

tion of the New York State Department of Health, Albany.

DR. FRANKLIN G. EBAUGH, Professor of Psychiatry, University of Colorado School of Medicine, Denver, has been conducting a course in Mental Hygiene at the University of Hawaii during the summer, and is making a survey of mental hygiene problems in Honolulu under the auspices of the Chamber of Commerce. It is planned to establish a psychiatric clinic.

DR. HAROLD M. ERICKSON, of The Dalles, Ore., has been appointed Health Officer of The Dalles and Wasco County.

DR. FRED A. FORNEY, of Woodmen, Colo., has been appointed Director of the new Division of Tuberculosis of the Colorado State Department of Welfare, with headquarters in Denver.

J. C. GEIGER, M.D.,* Director of Public Health, City and County of San Francisco, Calif., was recently named President of the Pasteur Society of Central California.

JAMES W. HAWKINS, M.D.,† formerly of Coeur d'Alene and recently head of the Twin Falls County Health Unit, has been appointed Director of Public Health of Idaho, with offices at Boise, Idaho. He succeeds JAY D. DUNSHEE, M.D.,* who went to Idaho in December, 1935, as medical adviser and was appointed to the position when it was created in March, 1937.

JESSE H. HENDRY, M.D.,† of Tacoma, Wash., has been appointed Physician in Charge of Tacoma Hospital, a federal institution for Indians, to succeed DR. JOHN N. ALLEY.

COIT I. HUGHES, M.D., was recently appointed State Superintendent of Public Health for Arizona, to succeed GEORGE C. TRUMAN, M.D.,† of Phoenix.

DR. LAWRENCE E. C. JOERS, of Tacoma, Wash., has been appointed Health Officer of Pierce County, to succeed DR. HINTON D. JONEZ.

ALTON A. JENKINS, M.D.,† has been appointed to have charge of the Southwestern District of the new public health unit established in Utah, with headquarters in Cedar City.

DR. JOHN M. KIRBY, of Bakersfield, Calif., has been placed in charge of a newly created health unit in Monterey County, Calif.

JULIAN O. LONG, M.D.,† formerly Health Officer of the Eighth District of New Mexico, has been placed in charge of the Third District, with headquarters in Albuquerque.

DEATHS

ARTHUR O. PETERS, M.D.,† Commissioner of Health of Dayton, Ohio, died recently.

HARVEY D. BROWN, PH.D., Director since 1923 of the Philadelphia Health Council and Tuberculosis Committee, Philadelphia, Pa., died August 21. He was Founder of the Anti-Tuberculosis Society of Wisconsin and a former Director of the National Tuberculosis Association.

WILLIAM BROSMITH, of Hartford, Conn., the Dean of insurance counsel in the United States, died on August 22, at the age of 82. Mr. Brosmith was Vice-President and General Counsel of the Travelers Insurance Company. Since the beginning of the City Health Conservation Contest, conducted by the United States Chamber of Commerce and the American Public Health Association, Mr. Brosmith has been a supporter of the Contest and has interpreted its aims and objectives to the insurance world.

* Fellow A.P.H.A.
† Member A.P.H.A.

CONFERENCES AND DATES

American Public Health Association —Sixty-sixth Annual Meeting. New York, N. Y. October 5–8.

MEETINGS OF THE FOLLOWING RELATED ORGANIZATIONS:

American Association of School Physicians. Annual Meeting in conjunction with Annual Meeting of the American Public Health Association. Hotel Pennsylvania, New York, N. Y. October 5–8.

American Association of State Registration Executives. McAlpin Hotel, New York, N. Y. October 5–8.

American Statistical Association—Biometric Section. McAlpin Hotel, New York, N. Y. October 8.

Association of Women in Public Health. Hotel Pennsylvania, New York, N. Y. October 6.

Conference of State Sanitary Engineers. Hotel Pennsylvania, New York, N. Y. October 5–6.

Delta Omega. McAlpin Hotel, New York, N. Y. October 6.

Federation of Sewage Works Associations. Hotel Pennsylvania, New York, N. Y. October 8.

National Organization for Public Health Nursing—Course Directors. Hotel Pennsylvania, New York, N. Y. October 7.

National Society for the Prevention of Blindness. Hotel Pennsylvania, New York, N. Y. October 6.

Public Health Association of New York City. Governor Clinton Hotel, New York, N. Y. October 5.

Academy of Physical Medicine—Fifteenth Annual Meeting. Hotel Walton, Philadelphia, Pa. October 19–21.

American Academy of Orthopaedic Surgeons. First West Coast Meeting. Hotel Biltmore, Los Angeles, Calif. January 16–20, 1938.

American Association for the Advancement of Science, and Annual Science Exhibition. Murat Theater, Indianapolis, Ind. December 27–30.

American Clinical and Climatological Association. Baltimore, Md. October 11–13.

American College of Physicians,. Waldorf-Astoria Hotel, New York, N. Y. April 4–8, 1938.

American College of Surgeons. Chicago, Ill. October 25–29.

American Dietetic Association—Twentieth Annual Meeting. John Marshall Hotel, Richmond, Va. October 18–21.

American Education Week. November 7–13.

American Institute of Nutrition. Baltimore, Md. Spring, 1938.

American Statistical Association. (Several sessions on Vital Statistics and Biometrics.) Haddon Hall, Atlantic City, N. J. December 27–31.

American Water Works Association. New Orleans, La. April 25–28, 1938.

Association of Dairy, Food and Drug Officials of the United States. Raleigh Hotel, Washington, D. C. October 26–29.

Association of Military Surgeons of the United States. Ambassador Hotel, Los Angeles, Calif. October 14–16.

Biennial Conference of the National Association for Nursery Education. Theme: Safeguarding the Early Years of Childhood. Nashville, Tenn. October 20–23.

Fifth International Heating and Ventilating Exposition. Grand Central Palace, New York, N. Y. January 24–28, 1938.

International Association of Milk Dealers. Dallas, Tex. Oct. 21–23.

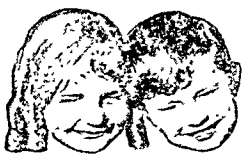
International Association of Milk Sanitarians. Brown Hotel, Louisville, Ky. October 11–13.

Iowa Public Health Association. Des Moines, Ia. May, 1938.
Medical Library Association. Boston, Mass., May, 1938.
Michigan Public Health Association. Lansing, Mich. November 10–12.
Mississippi Public Health Association. Second Annual Meeting. Jackson, Miss. December 9–10.
Missouri Water and Sewerage Conference, Thirteenth Annual. Lakeside, Mo. October 21–23.
National Association of Exterminators and Fumigators, Inc. Hotel Peabody, Memphis, Tenn. October 25–27.
National Conference of Social Work. Seattle, Wash. June 26–July 2, 1938.
National Safety Congress and Exposition (26th). Kansas City, Mo. October 11–15.
National Warm Air Heating and Air Conditioning Association. New York, N. Y. January 24–26, 1938.
New England Milk Producers Association. Boston, Mass. October 26–27.
New England Sewage Works Association. Worcester, Mass. October 1–2.
New Jersey Health and Sanitary Association—63rd Annual Meeting. Princeton, N. J. December 10–11.
New York State Association of Public Health Laboratories — Mid-Year Meeting. State Laboratory, Albany, N. Y. Friday, October 29.
New York State Conference on Social Work. New York, N. Y. October 19–22.
New York State Health and Physical Education Association. Syracuse, N. Y. December, 1937.
Ohio Conference of Sewage Operators. Cincinnati, Ohio. October 19–20.
Ontario Hospital Association. Toronto, Ont. October 21–23.
Pan American Medical Association—Seventh Cruise Congress to Havana. (Pan American Medical Association, 745 Fifth Avenue, New York, N. Y.) January 15–31, 1938.
Pennsylvania State Organization for Public Health Nursing. Altoona, Pa. October 28.
Second National Conference on Educational Broadcasting. Chicago, Ill. November 29, 30, December 1.
Southern Medical Association. New Orleans, La. November 28.
West Virginia State Health Conference. Charleston, W. Va. November 8–10.

FOREIGN

Institute of Sewage Purification. London. November 19.
World Conference on Leprosy. International Leprosy Association. Cairo, Egypt. March 21, 1938.
Hawaii Territorial Medical Association. Honolulu, T. H. May, 1938.

PEDICULOSIS



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Positions Wanted

HEALTH OFFICER

Physician, who has completed Vanderbilt short course, 1936, desires position as health officer. Has had 6 years' experience. Colorado, Kansas, Nebraska, Missouri or other states considered. Salary open, or standard. A-320

STATISTICIANS

Young man, with 8 years' experience in public health statistics in well known national organization and degree in Business Administration, now employed, will consider statistical position or combination with office administration. S-310

Young man, B.S. and M.S.P.H., University of Michigan; experienced in statistics and health appraisal work in addition to training in general health work, is interested in a statistical or administrative position in a health agency or hospital. S-319

SANITARY ENGINEER

Sanitary Engineer, courses at Rutgers University, with 17 years' experience in design, research and construction of water and sewage plants, as well as aerial pollution surveys, desires position, preferably research. E-321

LABORATORY

Young woman, M.S. University of Michigan, experienced in biochemistry, bacteriology, water analysis and blood work, now employed, will consider research position. L-322

Gentleman, Ph.D., University of Southern California; special courses at Pasteur Institute, Paris, wishes position as director of a laboratory, in research work or in field investigation. Has had wide experience as instructor in bacteriology in a State University, director of a state hygienic laboratory, director of several hospital laboratories, and research assistant, department of bacteriology in a large western university. L-315

MISCELLANEOUS

Physician with post-graduate studies in public health at the University of Michigan, seeks employment in public health field. Has served as Acting Assistant Surgeon, U.S.P.H.S., part time county health officer and assistant director of a state health department division of maternal and child health. M-309

Woman, with excellent preparation and wide experience in health education field: organization, administration, supervision and program-making in city, rural and state work. Now employed but would consider good opportunity. $3,500 minimum. M-316

Chemist and technical executive with wide experience in food technology, quality control, both official and commercial, teaching of biochemistry and food control in prominent eastern university; experience in public health administration, industrial hygiene, research organization and development; patent and legal experience Numerous publications in technological, public health and public health fields, written in both technical and popular styles. Genial personality, executive ability, initiative, broad scientific and public interests. Experienced in addressing public groups, and fostering favorable public relations. M-317

Young man, M.S.P.H., University of Michigan, 1937, desires position as sanitarian. M-323

Young woman, Ph.D., Yale University, experienced in the field of bacteriology and immunology, will consider a position in health organization, education or the administrative field. M-324

Physician, M.D., completing course in public health at Columbia, experienced in pediatrics, will consider opening in child hygiene, epidemiology or public health administration. M-325

Young woman, M.S., University of Minnesota, wishes position as health education director. An excellent background of experience covers directorship of a state laboratory of hygiene, health education director of a state tuberculosis association, instructor in bacteriology and health education, and executive secretary of a dairy council. M-326

Gentleman, Ph.D., Cornell, 1923, major in dairy bacteriology and biochemistry, will consider teaching, executive or administrative position. Wide experience in executive and administrative work in public health laboratory. M-339

Positions Available

U. S. Civil Service Commission will receive applications for positions of Associate Medical Officer at $3,200 per year and Associate Dentist at $3,200 per year, up to October 18, 1937. *Application forms may be obtained from U. S.* Civil Service Commission, Washington, D. C., or any first-class post office.

Where no other address is given excepting the key number, address your replies to the American Journal of Public Health, 50 West 50th Street, New York City, indicating clearly the key number on the envelope. Your replies will then be forwarded.

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(Continued)

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CANNED FOODS IN THE CONTROL OF LATENT AVITAMINOSES

In June, 1935, this space was devoted to a discussion of some of the general aspects of latent avitaminoses. It appears pertinent to report some of the more recent ideas in regard to this important field.

Considering the subject of avitaminoses in its entirety, the modern medical attitude is aptly expressed by the following statement: "... the mild or latent forms of the vitamin deficiencies are more important in practice at present than the fully developed cases. The latter are uncommon, are easily recognized and are usually promptly and adequately treated. On the other hand there is reason to believe that minimal or mild forms of these diseases are much more frequent, often escape recognition and, because of their insidious effect on large numbers of people, constitute a more serious problem than the occasional advanced cases." (1)

Consideration of this statement brings home the importance of optimum vitamin intake. Students of nutrition agree that in order to achieve this objective, a liberal and varied diet must be available. The constituents of the diet should be wholesome foods, the preparation of which has not materially reduced their intrinsic nutritive values. Commercially canned foods fall well within this classification.

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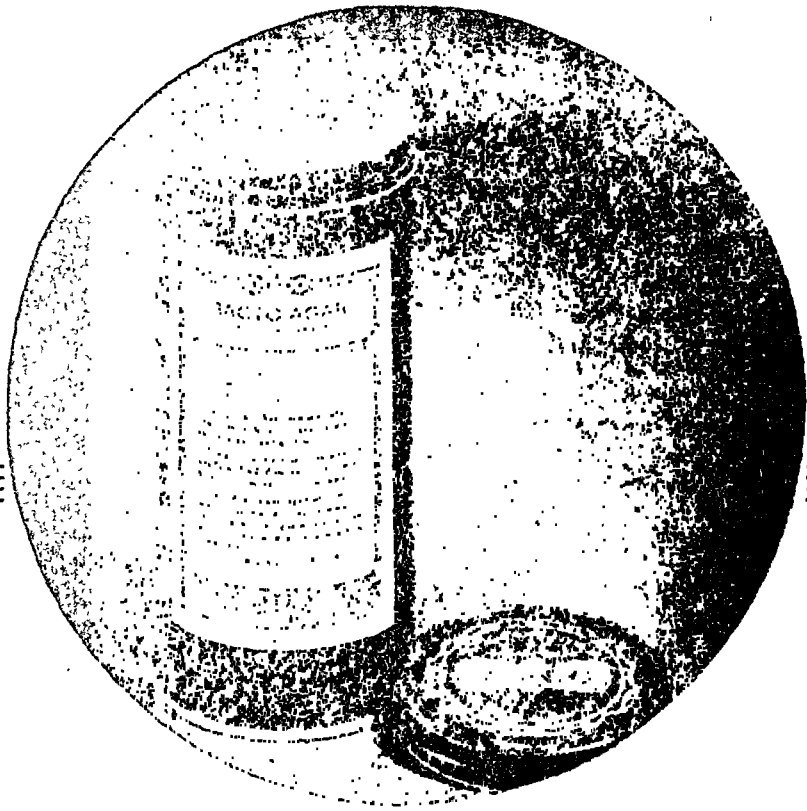
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(1) 1937. J. Am. Med. Assn. 108, 15.
(2) 1936. J. Nutr. 12, 405.
(2) 1936. J. Am. Diet. Assn. 12, 231.
1936. J. Nutri. 11, 383.
1936. Ind. Eng. Chem. 28, 1009.
(2) 1935. J. Home Econ. 27, 658.
1935. U. S. Pub. Health Rpts. 50, 1333.
1935. Am. J. Pub. Health 25, 1340.

This is the twenty-ninth in a series of monthly articles, which will summarize, for your convenience, the conclusions about canned foods which authorities in nutritional research have reached. We want to make this series valuable to you, and so we ask your help. Will you tell us on a post card addressed to the American Can Company, New York, N. Y., what phases of canned foods knowledge are of greatest interest to you? Your suggestions will determine the subject matter of future articles.



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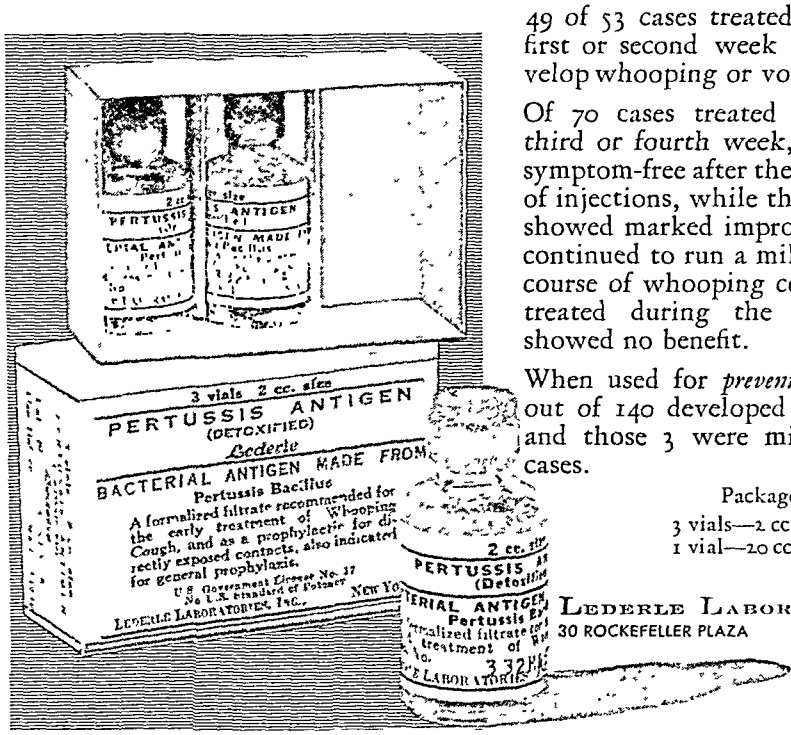
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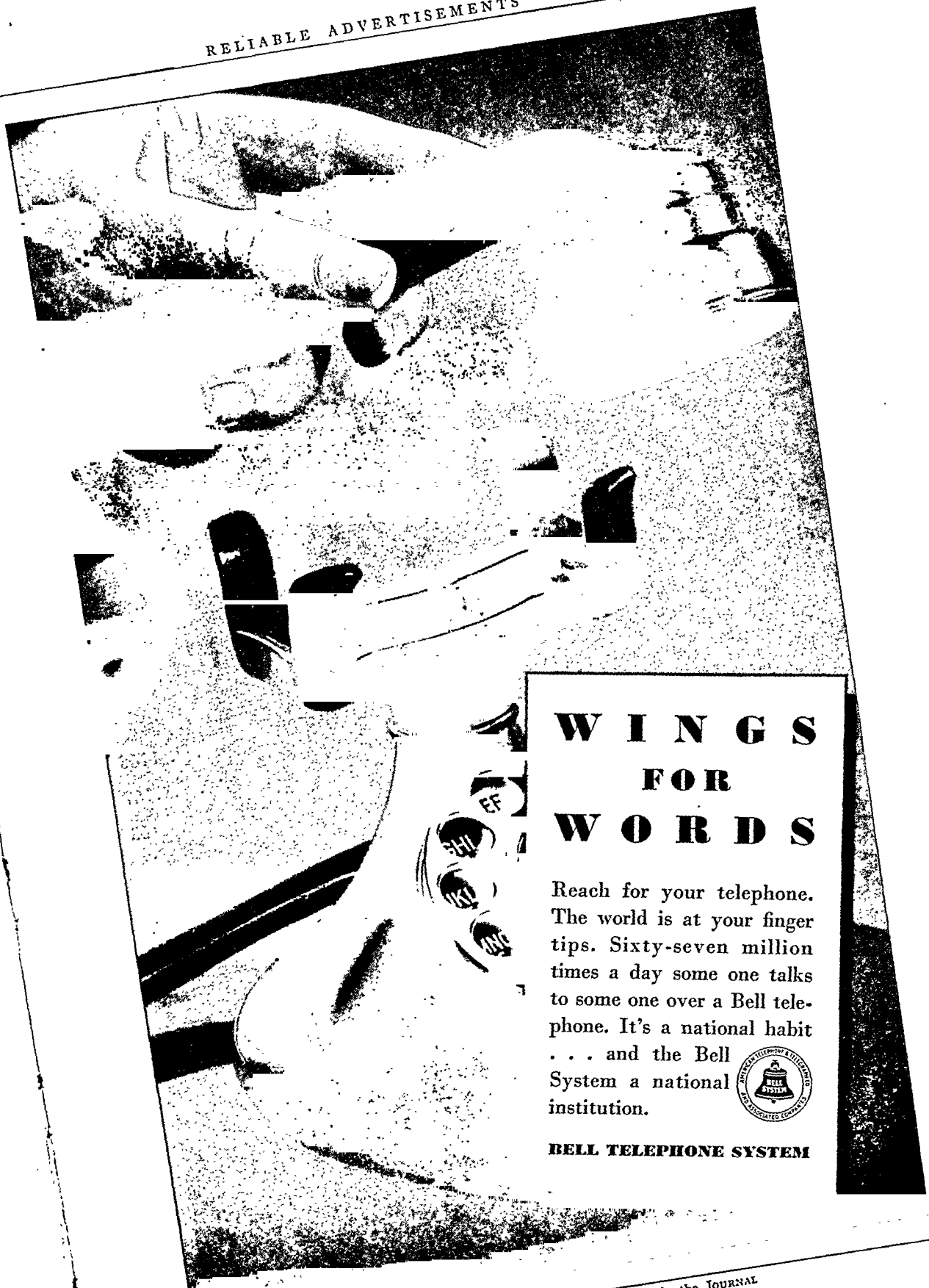
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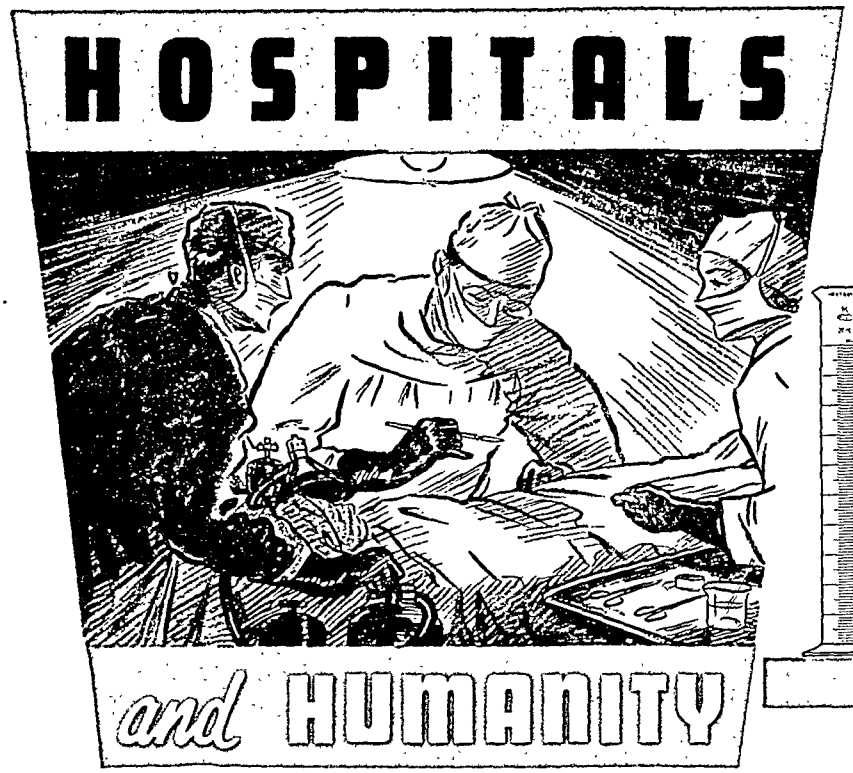
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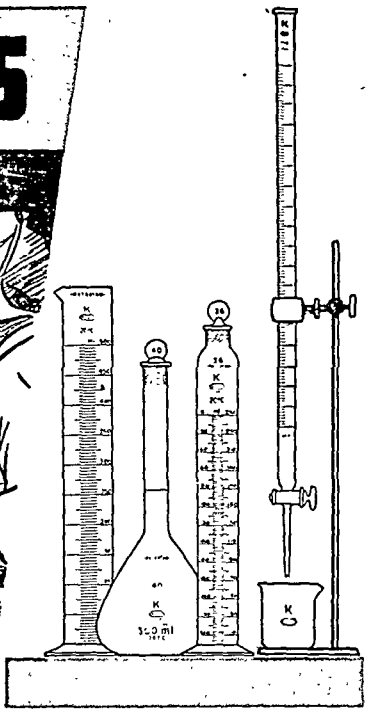
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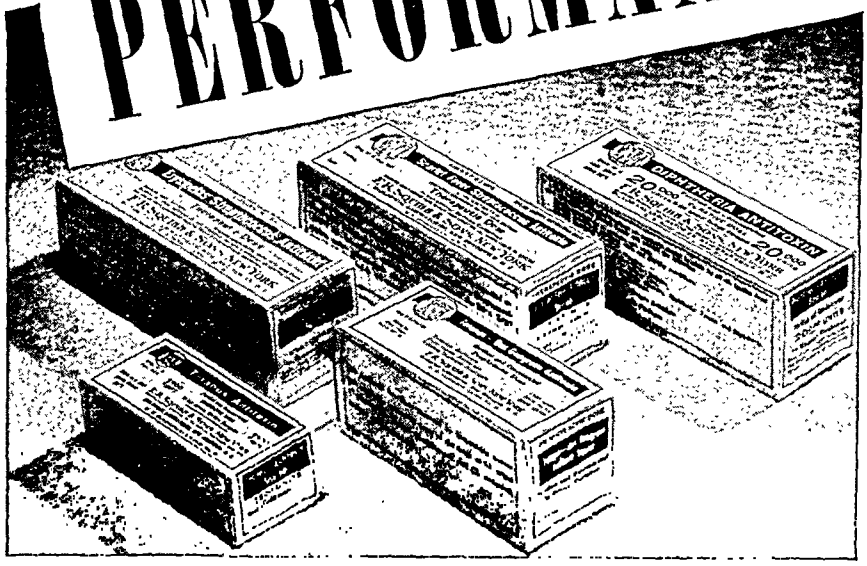
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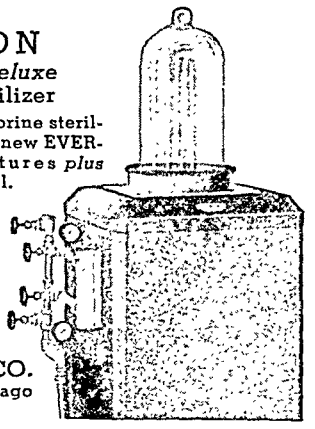
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Society and Secretary	Next Meeting
CONNECTICUT PUBLIC HEALTH ASSOCIATION Benjamin G. Horning, M.D., Hartford Board of Health, Hartford	Hartford, December 1
FLORIDA PUBLIC HEALTH ASSOCIATION Edward M. L'Engle, M.D., State Board of Health, Jacksonville.	Tallahassee, Dec. 6–8
GEORGIA PUBLIC HEALTH ASSOCIATION M. E. Winchester, M.D., Commissioner of Health, Brunswick.	Atlanta, May 1938
MASSACHUSETTS PUBLIC HEALTH ASSOCIATION G. Donald Buckner, 69 Coolidge Avenue, Needham.	Boston, Jan. 27, 1938
MICHIGAN PUBLIC HEALTH ASSOCIATION Marjorie Delavan, State Department of Health, Lansing.	Lansing, Nov. 10–12
MISSOURI PUBLIC HEALTH ASSOCIATION John W. Williams, M.D., County Health Officer, Springfield.	To be announced
NEW MEXICO PUBLIC HEALTH ASSOCIATION Paul S. Fox, Box 711, Santa Fe.	Albuquerque, Nov. 18–19.
NORTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION I. O. Church, M.D., Alameda County Hospital, Oakland.	To be announced
OHIO FEDERATION OF PUBLIC HEALTH OFFICIALS W. D. Bishop, M.D., Darke County Health Unit, Greenville.	March or April, 1938
PENNSYLVANIA PUBLIC HEALTH ASSOCIATION J. M. J. Raunick, M.D., Health Officer, Harrisburg.	To be announced
PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY Frank Kiernan, 386 Fourth Avenue, New York.	To be announced
SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION Ruth George, State Board of Health, Columbia.	To be announced
SOUTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION R. L. Kaufman, M.D., 402 So. Greenleaf St., Whittier.	To be announced
TEXAS PUBLIC HEALTH ASSOCIATION P. A. Kerby, State Department of Health, Austin.	Dallas, Nov. 1–3.
VIRGINIA PUBLIC HEALTH ASSOCIATION B. B. Bagby, M.D., Pres., 1302 Avondale Avenue, Richmond.	To be announced
WEST VIRGINIA PUBLIC HEALTH ASSOCIATION Dr. Edwin Cameron, Wetzel County Health Dept., Martinsville.	Charleston, Nov. 8–10.
SOUTHERN BRANCH, A.P.H.A. G. Foard McGinnes, M.D., State Department of Health, Richmond.	To be announced
WESTERN BRANCH, A.P.H.A. William P. Shepard, M.D., Metropolitan Life Insurance Co., 600 Stockton Street, San Francisco.	Portland, Ore., May 30, 1938

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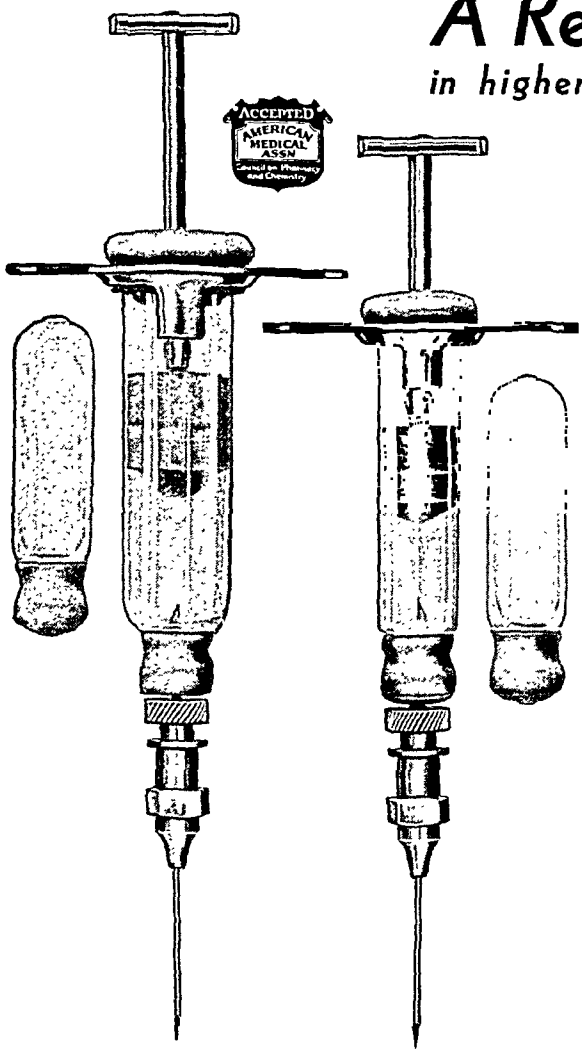
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(5) 1937. The Avitaminoses Eddy and Dahldorff William and Wilkins Baltimore
(6) 1936. J. Nutr. 12, 405
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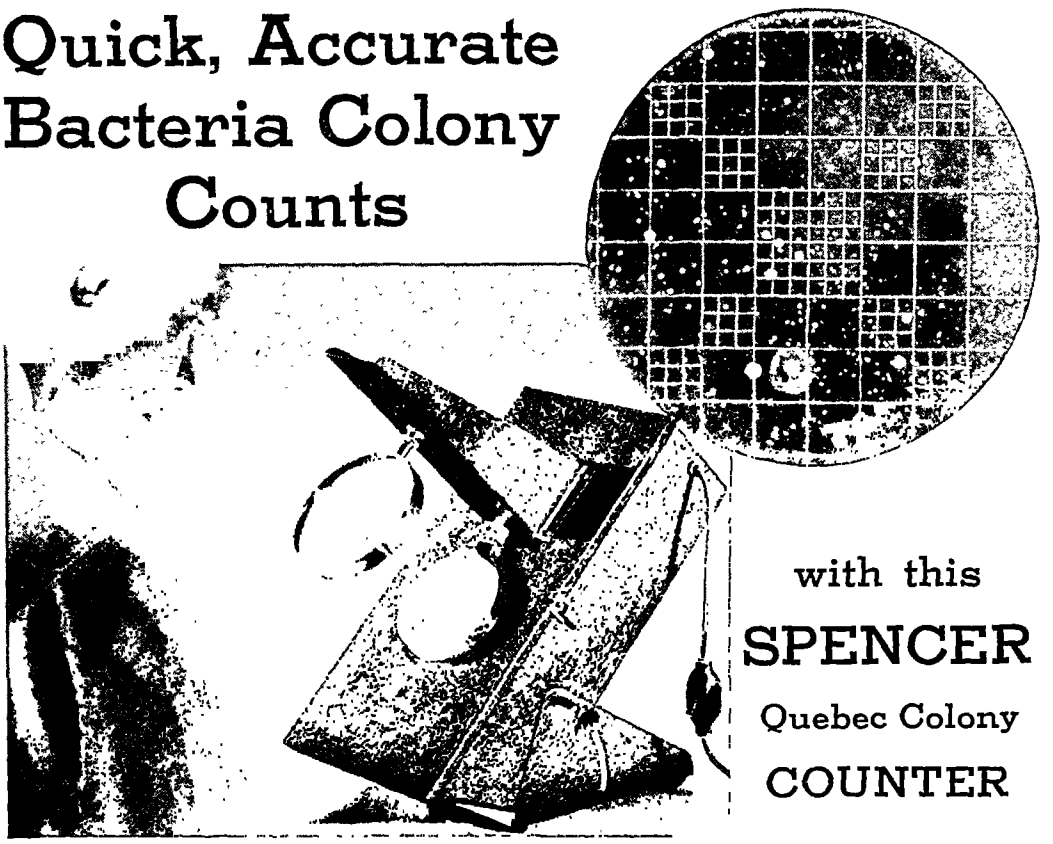
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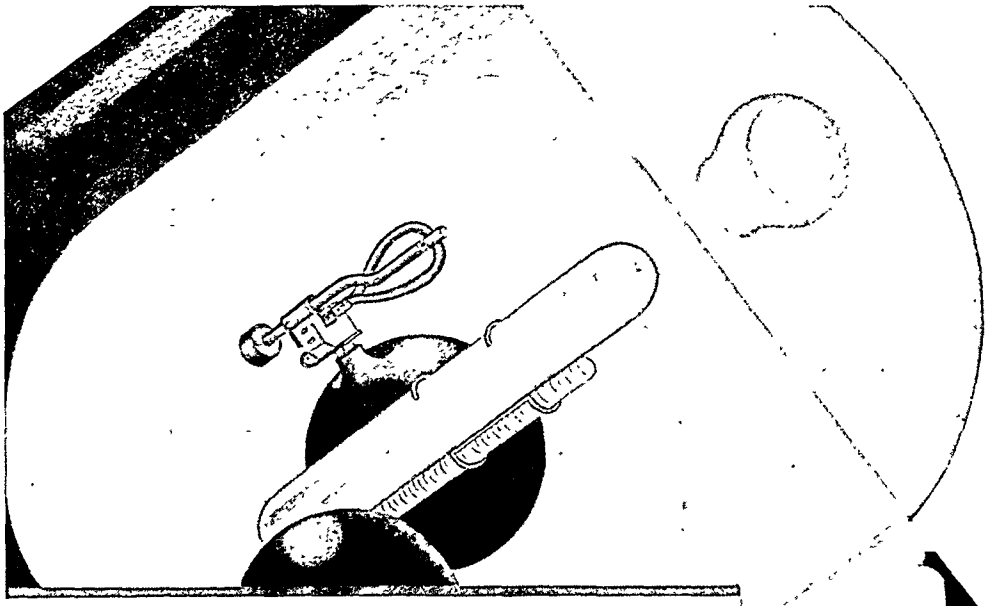
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American Journal of Public Health
and THE NATION'S HEALTH

Volume 27 November, 1937 Number 11

Public Health the Basic Factor of Social Security*

ARTHUR T. McCORMACK, M.D., D.P.H., D.Sc., LL.D., F.A.P.H.A.
President, American Public Health Association; and State Health Commissioner, Louisville, Ky.

PROBABLY I should spend some time in expanding the customary platitudes about my gratitude for my elevation to a position of such distinction among my fellows. Having read Dr. Ravenel's monumental history of the American Public Health Association and. having heard most of its Presidential Addresses for forty years, I can simply say to you that I thank you and that I accept the task you have assigned me with as much humility as is possible for a man of Irish extraction. I am sure I may also say, without invidious distinction, that I am especially honored in succeeding in the Presidency my friend, and our Chief, Dr. Thomas Parran. Were I to tell you what I know about him as a physician, a youngster in the tedious years of plodding routine in public health work, as an Assistant Surgeon General in a particularly difficult field, as a State Health Commissioner, as Surgeon General, I would merely describe to you the man and the administrator to whom we gladly give our allegiance and who, we know, will never falter in well doing.

My frank friends among you have placed me in a dilemma from which I find it difficult to extricate myself. Many of you have feared that I would talk too long; many more, that I would say too little; half of you have told me that you would leave the room if I start to read a formal address; the other half have bluntly said they will leave if I begin speaking extemporaneously. In trying my level best not to disappoint all of you, I am afraid you will find that I have followed the classic fable of Æsop and in trying to grasp the substance and the shadow, have missed both, and just got myself wet.

I shall attempt to solve my dilemma by following the example of one of my colored friends down in Southern Kentucky, who was a deacon in his church and always sat in the Amen Corner.

* Presidential Address delivered before the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

One night his parson had preached a particularly moving sermon and many of his hearers began shouting. A comely young negress became highly excited and, after a few moments of shouting and shaking, first threw off her coat, then her jacket, then her shirtwaist, and when she began fumbling with her belt the parson exclaimed: "If any Brother looks upon the Sister while she is in the state of exaltation, he will be struck blind." My deacon friend put his hand over his right eye and whispered audibly, "Well, Parson, I will risk one eye on it." So, I shall keep one eye on the manuscript and the other on my audience and hope to give due consideration to both.

One of the most distinguished authorities in public health, Dr. Milton J. Rosenau, wrote:

> Preventive medicine dreams of a time when there shall be enough for all, and every man shall bear his share of labor in accordance with his ability, and every man shall possess sufficient for the needs of his body and the demands of health. These things he shall have as a matter of justice and not of charity. Preventive medicine dreams of a time when there shall be no unnecessary suffering and no premature deaths; when the welfare of the people shall be our highest concern; when humanity and mercy shall replace greed and selfishness; and it dreams that all these things will be accomplished through the wisdom of man. Preventive medicine dreams of these things, not with the hope that we, individually, may participate in them, but with the joy that we may aid in their coming to those who shall live after us. When young men have vision the dreams of old men come true.

Dr. Rosenau might well have paraphrased this high ideal by substituting "the medical profession" for "preventive medicine."

In 1879, Samuel D. Gross, one of the founders and afterward President of both the American Medical Association and the Kentucky State Medical Association, delivered the oration at the dedication of the monument at Danville, Ky., erected to the memory of Dr. Ephraim McDowell, whose performance and report of the first ovariotomy in that little village sixty years before enshrines him as one of the immortals in the history of surgery. He closed with the following prophetic words:

> Young men of the Kentucky State Medical Society, listen to the voice of one who has grown old in his profession, and who will probably never address you again, as he utters a parting word of advice. The great question of the day is, not this operation or that, not ovariotomy or lithotomy, or a hip joint amputation, which have reflected so much glory on Kentucky medicine, but is preventive medicine, the hygiene of our persons, our dwellings, our streets; in a word, our surroundings, whatever and wherever they may be, whether in city, town, hamlet, or country, and the establishment of efficient town and state boards of health, through whose agency we shall be the better able to prevent the origin and fatal effects of what are known as the zymotic diseases, which carry so much woe and sorrow into our families and which often sweep, like a hurricane, over the earth, destroying millions of human lives in an incredibly short time. The day has arrived when the people must be roused to a deeper and more earnest sense of the people's welfare, and when suitable measures must be adopted for their protection as well as for the better development of their physical, moral, and intellectual powers. This is the great problem of the day, the question which you, as representatives of the rising generation of physicians should urge, in season and out of season, on the attention of your fellow citizens; the question which, above all and beyond all others, should engage your most serious thoughts and elicit your most earnest cooperation. When this great, this mighty object shall be attained; when man shall be able to prevent disease and to reach with little or no suffering his three-score years and ten, so graphically described by the Psalmist, then, but not till then, will the world be a paradise, with God, Almighty, All-wise, and All-merciful, in its midst, reflecting the glory of His majesty and power, and holding sweet converse in a thousand tongues with the human family.

Every one here present will recall that in 1879, when these inspiring

words were uttered, Pasteur and Koch had just begun to show the results of their scientific research, and that cities, states and nations were not only intermittently paralyzed by epidemics of proportions beyond our conceptions, but that the people of this and other nations suffered from a crushing burden of continuous ordinary illness, which they accepted as just as necessary and commonplace as the succession of day and night and the changing of the seasons. Human nature has changed but little since 1879, as it had changed but little before. The consternation, fear, and expensive, and, too frequently, wasteful efforts at relief aroused in the mob psychology of that day by cholera and yellow fever, were similar to those which today mark the advent of an epidemic of meningitis or encephalitis.

Progress seemed terribly slow to the few impatient enlightened men of that time, as it seems now to you. Medical education was controlled commercially, and from our schools of medicine there came not only the leadership, which preserved its traditions and altruism, but a horde of incompetents who knew as little about the teachings of Hippocrates and the practice and science of medicine as they did about the movements of the stars. During all these years, however, as now, brilliant minds were seeing and demanding "first things first." The great State Health Departments of Massachusetts and Pennsylvania were initiating the plans for environmental sanitation and purification of water supplies that have made our urbanization and industrialization possible. Possibly the greatest medical statesman in America, Jerome Cochran, was writing into the Constitution of Alabama the responsibility of organized medicine for the training and control of its own personnel and placing squarely on the shoulders of the medical profession the responsibility for the care of the public health. Whatever progress was made then, and until a few years ago, was usually amebic in its character and came as a result of the advantage taken by one man of an irritant in the form of an incident, an epidemic, or a disaster. Typical of this, a slightly inebriated reporter, indignantly telling Henry Watterson of having been fed a horse-meat sandwich, started a movement resulting in scientific meat inspection in Louisville, which has continued since. Modern milk control in Kentucky was begun when a rugged individualist, who milked a few tuberculous cows in a dirty barn, took a potshot at a health officer who urged him to clean up. Similar instances might be cited, indefinitely, in every state.

Intelligent, broad-scale public health work on a real foundation began to take shape in this country with the formation of the Rockefeller Commission for the Eradication of Hookworm Disease. Conceived in the philanthropy and charity, in the true sense of that much abused word, of Mr. Rockefeller, this commission arranged for the practical application of the results of the scientific research of Stiles to the finding of hookworms, and to the cure, prevention, and eradication of hookworm as a disease. To this end, an army of full-time scientifically trained physicians was put in the field under the leadership of a very great educator in public health, the late Wickliffe Rose, and, later, our own John Ferrell.

Before this, many men had flashed into the proceedings of this Association thoughts from their experiences which have since been our armamentaria in the development of administrative practices. As early as 1904 my father was saying to the medical profession and people of most every county in the United States something which has not yet been done in half the counties in this country:

And, still more important, a board of health for each city and county, or for the two combined, with frequent inspections of schools, dairies, abattoirs, bakeries, groceries, factories, tenements, sewerage and garbage systems, and with laboratories to which any citizen may bring water, food, drugs, diseased products, or anything else suspected as a danger to his family, for analysis without personal expense, is of as much practical importance as any court or other official agency could be. And it is not worth while to try to do those things without a health officer with special training and aptitude for his work, and such a salary that he can devote his entire time to it; for no man can be the kind of health officer here described and practise medicine. The positions are so incompatible that it would be just as reasonable to expect a lawyer to act as judge and support his family by the practice of law at the same time. It would be the best of investments to provide such comprehensive health systems everywhere, as substitutes for the political make-shifts so generally in vogue, because the greatest annual tax upon our people is not that paid into municipal, county, state and national treasuries, but the long unrecognized tax for preventable sickness and funerals.

Four years later, in 1908, the first full-time health department was organized in Jefferson County, Ky., under his leadership. Shortly afterward similar departments were developed by Lumsden in the State of Washington and Rankin in North Carolina. The subsequent development of such departments is well known.

During these formative years we had been accustomed to muddled thinking and consequent badly managed public affairs. In education, in law, in agriculture, in finance, even in that most primitive of all man's organized activities, war, we had a superabundance of brilliant theory, but very little of the practical, except as concerned the welfare of the small group of individuals who profited from any intelligent activity. Thoughtful men and women were talking about dangers to society from lack of foresight and a plan, but their voices were as of those crying in the wilderness.

Then, suddenly, to the thoughtless, the stock-market collapsed. An era came to an end. We awakened to find national, state, and local treasuries bankrupt, to realize that from 10 to 12 millions of people out of work had been added to the standing army of 3 million constantly unemployed. We never before had admitted that unemployment had reached even these lower figures. We found our banks closed and credit paralyzed. In many cities, school teachers, policemen, and firemen were unpaid, products of the factory were not being purchased at all; and the food supplies from the farm brought prices that destroyed the value of land, which, after all, is the basis of human economy. Amidst what seemed to be universal ruin health departments shared the debacle. The only thing that was left untouched in all of this destruction was the courts whose procedure and adherence to precedents had been so firmly embedded in our constitutional system by their lawyer writers that they seem intended to be the last surviving hazard to human progress from the old régime.

A man who had been acclaimed by many as the greatest public financier the world had yet produced, guiding the financial Ship of State at this period, is said to have made this gloomy statement at a breakfast party:

> I feel as a man who had traveled far afoot, and, awakening in the shade of a deep, stony, waterless valley, I look out and see no highway, no road, no path by which I can emerge; from my viewpoint, I can see in the awesome rocks that surround me not even a slight depression through which I may leave or hope may enter.

And, surprisingly, suddenly, a glimmer of light seemed to appear in this chaotic and awesome scene. By a gigantic recasting of the machinery, banks, insurance companies, railroads and great corporations were made solvent. Credit was restored; money

was revalued, so that it might be of service to rather than the master of, the people. The unemployed were at first merely fed and clothed, and then given made-work. A little later, began the real reconstruction of national resources—the thing of prime importance to every citizen, but which the few who had heretofore controlled wealth had neglected so long in their self-aggrandizement. These and forty other recovery plans were made possible because of the patriotism, patience, and good sportsmanship of the American people. They recognized in statesmen an interest in the welfare of all of the people, even those who had hitherto been forgotten, and they followed this leadership into the development of a planned social security, the mere foundations of which have now been laid, but which is probably destined more completely to revolutionize the activity of the human race than any other program ever enacted into law.

This plan includes the stability of banks, insurance companies, railroads, and corporations, and, through them, our whole financial structure, so they and it will serve all the people; the provision, through private capital or credit, or if these fail, through federal, state, and local coöperation, of work for the unemployed; large scale economic research in methods, still largely in the process of development, for settlement of the natural differences between capital and labor, for promotion of agriculture and agricultural markets and the conservation of our natural resources as the possessions of all the people; and the passage of the Social Security Act itself, with its broad provisions for old age assistance and pensions, unemployment compensation, aid for the crippled and blind, vocational training for those injured in industry, and, what is of first importance to you, increased federal assistance, so that the states may improve the local administration of public health, including maternal and child health, through state devised control, plans and policies. The operation of this plan for a couple of years has enabled us to develop statistics, on which public attention has been focused, showing the already too large and rapidly increasing number of people who are becoming charges on society because of ill health, mental or physical, unrecognized and untreated. This ill health is, in a large measure, due to causes which the leaders in medical science know how either to prevent or to cure in the early stages before invalidism or incapacity has become permanent. The facts and figures brought out may well make us question our methods, examine and reëxamine them to find where the fault is. In these sessions and in our plans for continuous learning in all of our health departments through the year, and in all the meetings of our allied organizations in nursing, dentistry, engineering and pharmacy, and in the great organization, the American Medical Association, we are all working together around conference tables trying to evaluate plans which will preserve the autonomy of the states, and develop procedures, tried and proved by social and scientific research, which will best improve health and lessen disease and accidents in our respective states, counties, or districts.

The best care of the sick individual is, ordinarily, by his own family physician, in his own home. The best treatment of complications in 99 per cent of all serious illness is by the family physician, in consultation with the consultant of his and the family's choice, in the best hospital in the general vicinity of his home. Just so, the diagnosis of health conditions and those which produce bad health must be studied and carefully planned by or

through the unit of government closest to the people. For administrative convenience and economy, this has been found to be the county or a combination of counties into a district.

Of equal importance is the provision in the Social Security Act for the actual recognition of the U. S. Public Health Service as the operating federal health agency. Before these dreams became realities, the recognition of any national responsibility for public health was embryonic, being entirely overshadowed by the functional medical service and regulatory activities of the old Marine Hospital Service, continuation of a considerable part of which was justified only by its antiquity. Even now this section of public health service responsibility absorbs 75 per cent of the personnel, and costs almost one-half the total appropriation for functions which Congress and the people believe are public health services, but which, whatever be their worth in other regards, in reality have little preventive value. Under Dr. Cumming's administration, a State Relations Service was developed which was so ideal in principle and so devoid of friction in practice that it may be studied with profit and imitated by other branches of the federal government.

The broad social plan embodied in the Social Security Act recognized and crystallized into law the evolution that we have all realized was taking place in the integration of social agencies under an age-old heading that we have loosely denominated as the general welfare. We find ourselves closely allied not only with the physician, the nurse, and engineer, but with the welfare agency, whose trained social workers of various kinds are as necessary as any of these.

Just before his death, Edgar Sydenstricker extended this thought with the statement that—

> The physician is as necessary to the public health as is the health officer or the sanitary engineer. The work of the private nurse or the visiting nurse is as necessary as that of the public health nurse. The hospital and its out-patient department are as necessary as the health department. The welfare agency, with its trained social workers of various kinds, is as necessary as any of these.

Further extending this, Dr. Bishop has well said:

> Thus are conceptions of the present phase of public health service and a preview of tomorrow's phase, with its relation to the social sciences, epitomized by a close student of the public health movement. More and more with the stabilization of our population and limitation of geographic frontiers must we study economic frontiers. Increasingly will this study bring us face to face with the consideration of vital economics as compared to physical economics. Hence, increasingly, must the knowledge of the social scientist aid in determining the scope of essential service and in the organization of effort for the rendition of service.

Since the passage of the Act, which recognized and enacted into law this thoroughly practical, ideal relationship, Dr. Parran's administration has been so thoroughly sympathetic and effective that it has presented to state and local governments throughout these United States a challenge which we could not evade if we would. All of the states have adapted their plans so as to accept federal assistance in money under the provisions of law, but too many are still giving lip service to public health. To many, the organization is still a mere form, devoid of substance or real service to the people themselves, whom it is intended to serve. Under the regulations of the Act it is provided that certain fundamental state-wide functions shall operate through well organized divisions of a state board or department of health. After expenditure of the minimum amount of money actually necessary to develop and maintain the required

state functions, it is the intention of this Act that there shall be developed and maintained local full-time public health service, which will be actually in touch with and in reach of the people themselves, in their lives and in their homes. The whole social challenge of today is whether state and local governments can function with sufficient effectiveness to justify their continuance, except in the vestigial capacity in which many counties are existing in many states. It is as manifestly impossible to provide any continuing program in any state or local government where the election of the health officer is a personal and partisan action of a governor or of a local political administration as it is to guide education on such a basis. It is unthinkable that states may continue to change their state and local health executives with each changing political administration and continue to merit or secure recognition or financial support from a thoughtful Congress.

It is perfectly obvious to the thoughtful citizen that public health policies and administration should be under the control and guidance of the organized medical profession. From the public health standpoint, it must be admitted that the present training of physicians is based too largely on the recognition and knowledge of the pathological and the methods of arrest or cure; too little on the recognition and knowledge of the normal and the desirability of its protection and preservation. The leaders in medical organization realize this and they will solve this problem, as they have solved others far more difficult which have confronted them.

Will you not here pause and consider with me for a moment what has already been accomplished under medical leadership? Cholera and yellow fever and similar plagues are now historic to our people. Smallpox, which 150 years ago was the greatest scourge of mankind, is entirely eradicated among the intelligent. Diphtheria and typhoid fever are approaching the vanishing point. The incidence of tuberculosis has been decreased 60 per cent during this century, and enough money has been saved from lower morbidity and mortality from this one disease alone to pay the cost of our state and federal highway system. It has been clearly demonstrated that scarlet fever is eradicable, and it is almost as certain that whooping cough is. Massachusetts and New York are proving the possibility of reducing the annual death toll from pneumonia by 50 per cent or more, and cancer control in these two great states is approaching a standard of excellence that will cause all of the other states to imitate their methods. Less has been done in controlling syphilis and gonorrhea than any other major pestilence, but, under the fine leadership of Dr. Parran, this shadow on the land is destined ere long to disappear under the actinic rays of scientific knowledge properly and continuously applied wherever an individual harbors these dread infections.

The death rate in Kentucky has been reduced two-thirds in 27 years, and the life expectancy has been increased from 32 to 60 years. You should warn your people, however, that this low rate cannot be continuously maintained, because, eventually, those who have been saved from unnecessary illness and premature death during their earlier or productive years will succumb to the degenerative diseases of age, which are only now beginning to be studied with a view to their control and elimination.

It should be remembered that when Dr. Gorgas went to Panama to assume control of its health department he found that the French had known as much about engineering, as much about labor mobilization and organization, as much about the commissary and its management, as we did; but he found

that half the Frenchmen who came to build the Canal died with yellow fever or malaria before they had time to take any part in digging the great waterway. His complete and rapid eradication of these diseases changed the whole picture of life on the Isthmus, which was rapidly transformed from one of the pestholes of the earth into the healthiest spot in which men live and work. It should be recalled that, instead of reducing the quantity or quality of those engaged in medical service, this happy condition increased both, because recognition and preservation of health required a more highly trained personnel, and the discovery of incipient disease while it is still curable is far more time consuming and difficult than the diagnosis of a fatal illness and its resulting post-mortem. When it is considered that the death rate in the Canal Zone is today, and has been for 20 years, about half that of the registration area of the United States, and that the morbidity rate is approximately one-twentieth of that of this country, it can be demonstrated to any thoughtful appropriating body that public health is purchasable and that good health can be secured for any state or community willing to pay the price.

You and I sometimes may feel discouraged and irritated by the ignorance and parsimony of officials and appropriating bodies, but the victories for health which Dr. Gorgas won in the Canal Zone were won in spite of the constant and malevolent opposition of his superior in control of the construction. Dr. Gorgas was fighting for humanity and he never lost his temper and never failed. He set an example in scientific knowledge, sound administrative procedure, development of trained personnel, persistency against official contumacy and opposition, and tact and diplomacy against apparently overwhelming control, which gives his memory to us as that of the ideal health officer, the ideal official, the ideal gentleman.

We must not only have freedom from pernicious partisan politics in our state, federal and local health organizations, but we must have continuing learning on the part of every individual connected with them, whether these individuals be physicians, nurses, engineers, dentists, educators, sanitary instructors or inspectors, technicians, or the stenographic and clerical assistants. This was provided in the Social Security Act. Not only should it be continuous in the staffs of the state departments themselves, but the personnel from groups of contiguous counties should be assembled at regular intervals for the acquisition of newer knowledge, comparison of methods and for that attrition of mind against mind that has been largely responsible for progress in the science of medicine through medical society meetings, as well as in formal refresher courses and graduate courses in universities having established departments of public health education.

What shall we do about medical service for those who are ill? I would urge that we make it our first objective to do well what has already been assigned to us by the common consent of all the people, with the approval of the medical profession, in the public health field. We should oppose, at all hazards, the socialization of medicine. We should give every assistance to those of our profession engaged in the practice of curative medicine in the solution of their problem of medical care of the indigent and of those only partially able to bear the cost of illness. The medical profession of America has proudly carried on the traditions which have been handed down from leader to leader since the days of Hippocrates. Sometimes the banner of science has seemed to be beyond the horizon of those who

most needed its encouragement; but it has always been found again and borne aloft by succeeding generations of those who have given this great service to mankind. Every other progressive agency has helped to promote and improve civilization, but no other can claim to be, or be acclaimed as a more faithful servant of mankind. Be assured that the American Medical Association, its autonomous constituent state associations, and component county societies are fully alive to their responsibility. Be not impatient with their progress. Prod and threaten them a little, if you will. Remember that they have always lived up to their responsibility to the people of this country and they always will. It is perfectly obvious that so great a service organization would, if it could be assimilated and controlled by any one of the social groups that would put their unhallowed hands upon it, be a conquest whose value would be beyond computation. But let these groups beware, because should they win such a costly war, it would become a Pyrrhic victory. The finer qualities that now characterize the physician would soon disappear in the routine of the official. As for the public health group in the medical profession, it behooves us to remember with pride the research, the achievements, the service, the lives of those who made all our knowledge possible. And we should recall constantly to ourselves, to our brethren, and to all the world that we are physicians, doctors of medicine, proud of our calling, ready to modify our plans and our methods whenever better ones can be devised. So long as we do this, we may look forward to the future unafraid.

It is not enough to stop with this tribute to medicine. It was about 72 years ago that the Lady of the Lamp walked through the darkness of the Crimea, and, with a tiny spark, aroused a force that has inspired the world. And yet for 40 years after Florence Nightingale lived and worked most people died during the ministration of Sairey Gamps. Clara Weeks and her associates began the systematic education of nurses within the memory of many now here. We have just celebrated the 25th birthday of the National Organization for Public Health Nursing. The public health administrator who would not bow to this fine group of those who serve would fail to recognize the right hand of medicine.

The work of the sanitary engineer needs neither recognition nor encomium from me. It is he who has made the city and the large industrial plant possible, and he is now robbing the countryside of many of its lurking dangers. It is to be doubly regretted that this splendidly developed and highly trained group of specialists should have been ignored and the whole principle of states' relations should have been violated, by the ill advised inclusion in the last Rivers and Harbors Bill of an amendment providing for a survey of stream pollution in the Ohio River by the Army Engineers. They are unacquainted with this subject, untrained in the solution of the problems involved, and their recommendations will be without real value. It is to be noted that the bill was signed with a protest by President Roosevelt against the transfer of this activity from the Public Health Service to the War Department. I strongly recommend that the Association again endorse the Vinson-Barkley Bill as it passed the House of Representatives. This legislation was prepared by joint committees of this body and the State and Provincial Health Authorities of North America, and its enactment was delayed in the last session by an attempt to provide for federal injunctive processes in connection with problems wholly within

the province of the various state health authorities.

In public health administration we are finding important support from one of the oldest of the professions which has, within a decade, developed a remarkable attitude toward modern dentistry's responsibility to public health. The researches of Billings and Rosenow in focal infections seemed, for a time, to fall on the deaf ears of the old time mechanical dentist, but the improvement in dental education has quite kept pace with that in medicine. The modern dentist is quite as much a part of the force that is improving public health as is any other profession. It is a particular pleasure to welcome a large group of dentists who are specializing in oral health into membership into this Association, to whose proceedings they can contribute much of practical interest.

In those engaged in public health education, I desire to recognize both those who must interpret us to ourselves and those who must make our purposes, methods, and objectives understood by the people. Theirs is truly a Herculean task and they are making fine progress toward its accomplishment.

I would express your appreciation to the sanitary instructors and inspectors, the technicians, the stenographers and clerks who are the burden-bearers in all of our work. It is not theirs to shine in the light of public approval, and yet, without them, how much slower would be our progress, how much more difficult our job.

In conclusion, may I say that, in the majority of the states, we are ready to take the next step. We need to secure larger, better trained personnel; to have more laboratory facilities; to have better equipment for our statisticians and technicians; and more travel for our field personnel. We need above all, to have more money for those county or district health departments where the human and economic needs are too great for them to bear this cost alone. To do all this, we need more money; to secure it, we need to integrate our service in public health, first, with the medical profession, and then, with every other social agency, including the great organizations of women who have given such active and intelligent support to public health progress, whose special value to themselves and their children they recognize. After all, the American people must decide whether they want freedom from syphilis and tuberculosis, a reduced death rate from cancer and pneumonia, less blindness and crippling, and increasing happiness and health in old age. If they determine that they do, they must, in addition to their support of their own physicians and nurses who care for them when they are sick, pay the cost of the increased community service which we know how to render and can render at a per capita cost so insignficant, in comparison with the beneficence of its results, that it may be easily justified of all men.

I invite you, one and all, to join me in a reconsecration of ourselves in that spirit of service which the Great Master so nobly exemplified, remembering always that the Great Physician was also the Great Teacher, the Great Social Worker, the Great Laborer, and the Great Humanitarian—one who considered nothing foreign to him which affected in any regard the welfare and happiness of mankind. I invite you to wear with me an invisible uniform, yet one which, whether worn by us or by those engaged in the great allied services, will be universally recognized as the uniform of an army battling for humanity—that men may have sounder minds in sounder bodies and thus be enabled to labor, to reason, to live and to produce, more happily, more effectively and more abundantly.

The Health Department in the Field of Medicine *

From the Standpoint of Experience in England

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MY allotted subject at once raises the question—What is the "Field of Medicine"? Time prevents me from contending that medicine is directly or indirectly concerned with every aspect of human life, for not one of these is without its influence on health, with the maintenance and resumption of which medicine is concerned.

But I accept, for the purpose of this discussion, the conventional limitations of medicine, and proceed on the assumption that we are concerned with the two great departments of medicine, preventive and clinical, in which we all are, or have been, actively engaged.

But, even thus, I find it necessary to make further limitations; for while I claim that the health departments of the State (including the official departments of cities and counties who have health officials) are *concerned with every branch of clinical medicine*, I must omit from my purview in this discussion some portions of preventive medicine, including the prevention of industrial and other accidents.

I have always maintained that a problem or subject can only be satisfactorily discussed in the light of knowledge of the stages by which the present position has been attained. It is by reviewing the factors concerned in past growth, that we can best learn prospects and hopes for the future.

For while it is true that irregular, intermittent, and ofttimes unbalanced growth is characteristic of social life, real growth is thus distinguished from schemes devised at a desk, which like mules commonly have no respectable paternity and are, furthermore, foredoomed to sterility.

Let me then attempt a lightning review of health departments in Britain. The first activities may be said to be prenatal, before Health Authorities existed.

My first illustration concerns the medical administration of the British Navy. In 1795, nearly half a century after its value was known, a daily ration of lemon juice was required to be taken by all sailors in the Navy. Prior to this, sailors had often been rendered

* Read before the Health Officers Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

helpless by scurvy, and the British Navy had been crippled in its fighting power, just as in later years the Japanese Navy was decimated by beriberi, until my fellow student Takaki introduced dietetic improvements for the Japanese sailors.

But scurvy was an illustration of compulsory reform in a compulsory service. Reform consisted in compelling sailors to swallow an unwanted daily drink to prevent a deficiency disease. The introduction of compulsory Jennerian vaccination against smallpox in 1840 affected the entire population of Britain. At that time, no Health Authorities existed, but Boards of Guardians undertook the succor and care of the destitute, which since Elizabethan days had been a national duty. A special public vaccinator was appointed in each area, whose duty it was to vaccinate all infants, except those whose parents preferred that their family doctor should do this.

This then was the first English example of *complete socialization of medical provision* in one particular respect. The provision still exists, though its compulsory character has been modified and, strangely enough, the administration of this national *ad hoc* medical provision remained until 1929 in the hands of Poor Law Authorities, long years after Health Authorities had split off from the authorities concerned with relief and treatment of the sick poor.

But it will be noted that, right away from Shaksperian days, no impoverished persons in Britain needed to suffer from lack of food, shelter, or medical care, the Boards of Guardians being under an obligation to supply their need. True that for a long time the medical aid was incomplete and imperfect, often scandalously so, but it remains true that for several centuries in Britain there has existed national provision for the general all-round medical treatment of those who cannot provide it for themselves.

Let me follow this medical treatment for the destitute further. Destitution has been defined to include inability to provide personally the medical care required for a given illness; and in the widest acceptance of this definition, how small a proportion of the total population of Britain or of the United States can be said to be other than destitute?

But limited in its application though it has been, the medical treatment of the destitute has improved enormously in the last 30 years in Britain; and in 1929 the possibility of further important progress was secured by handing over all official treatment of the sick to the great Public Health Authorities of cities and counties. It was further provided that any inhabitant of a given area should be entitled, if a suitable patient, to admission to the newly organized municipal or county hospitals. Thus the proviso of destitution as a condition of treatment was abandoned, but the Local Authority was instructed to assess each patient's capacity to pay a proportion of the cost of treatment. In practice the majority of patients in these institutions are treated gratuitously or at a small charge.

It will be noted that in Britain medical officers of health acting under the supervision of the elected members of their Public Health Committees are now responsible for general supervision and direction of the domiciliary and institutional treatment of the sick in their areas, in addition to their more general preventive work. This unifying principle exists, though in practice there is much delegation of duties.

There exist alongside of these official hospitals the voluntary or private hospitals, special and general, which in the past have borne such an important part in the treatment of the sick poor and

in the promotion of medical education; and although there are increasing difficulties in keeping up with the voluntary gifts called for by the necessarily increasing cost of treatment, they will doubtless continue for long years to participate in providing medical aid for the public, especially in our great centers of population.

Let me cite further more modern illustrations of the fact that treatment and prevention are Siamese twins. In the special period of rapid sanitary advance occurring between the 40's and 90's of the 19th century, Public Health Authorities concerned themselves chiefly, though never exclusively, with external sanitation, including scavenging, removal of nuisances and especially of excremental matter, sewerage, even more with measures for protecting water supplies, and for cleansing of houses and reduction of overcrowding. The immediate enemies aimed at were "fever" and cholera. Typhus began to decline, and this reduction was regarded as due to domestic cleansing and disinfection. It was even more due to the segregation of the sick in "fever hospitals."

Typhoid or enteric fever also declined under the new sanitary regime, and its reduction was attributed to better house drains and the reduction of noxious smells; but looking back we can be certain that the main factor was the safeguarding of public water supplies. (Carriers and shellfish as provokers of infection had not yet been ascertained.)

Fear of Asiatic cholera with hopes of reducing "fever" had been the chief factor favoring sanitary reform; and as regards both cholera and fever, treatment had been an indispensable measure. I recall that late in the 80's some health departments were still giving out gratuitously bottles of "Diarrhoea Mixture" when asked for by any inhabitant.

In the early years of the present century there came a revulsion against the exclusively "sanitary" point of view. After all, man as well as his surroundings needed attention. I cannot now follow the zigzagging progress of the personal aspect of health in chronological order. Very soon it overstepped the point of view of disease prevention by treatment, and became also a search after the retention and enhancement of health.

In 1902 the first Midwives Act was passed, bringing midwives under supervision and some partial control. We need perhaps to be reminded that usually childbearing is a physiological not a pathological process. Leaping forward, I can only stay to note that now Health Authorities are obligated to provide and pay for deficiencies in the midwifery service of their area.

Let us glance at the partially physiological child welfare services organized by Health Authorities, often with the help of the pioneer work of voluntary organizations. I can merely mention the vast number of health visitors now employed, and the child welfare centers in every area. They are mainly advisory and as such their value is beginning to be appreciated, by the parents not only of the poor, but also by others. It has been found impracticable to draw a strict line between hygienic advice and clinical treatment, especially for minor departures from health.

The same remark applies to the school medical service, which in most counties and boroughs is conducted from the health department. A vast number of defects, especially of the special senses, of the skin, and deformities, have been discovered, and even with full use of private medical practitioners, the education committees have found it necessary to organize measures on a large scale for the treatment of discovered ailments. Treatment

follows detection, and detection follows medical supervision. For dental caries a vast amount of dental treatment is undertaken by public health authorities, much of it gratuitously.

We may now hark back to the clinical side of public health work, having sufficiently indicated the impossibility of preventing preventive and curative measures becoming entangled, when we attempt to do for children and their mothers what we all agree is preventive work.

In 1911 was passed the National (Health) Insurance Act, which provided *inter alia* for the domiciliary medical treatment of one-third of the total population of England and Wales. The cost of this was provided in nearly equal sums by the worker and his employers, a large additional portion being also paid by the state.

Here then is a vast system (chiefly for heads of families and workers only) of ordinary medical treatment excluding (in the main) institutional treatment, provided by private medical practitioners chosen by the insured themselves; and it may be said at this point that the doctors themselves would resent and oppose proposals for the abolition of this communal medical practice.

Insurance medical practice has little direct relationship to the official health department, but this artificial separation cannot indefinitely continue, for closer union would greatly facilitate the conversion of insurance clinical practice, into a vast provision for utilizing private medical practitioners in the rôle in which they would become, as I have frequently urged, " medical officers of health within the range of their own medical practice."

But the present position is significant as an example of what is a modified state service of medicine with the retention of all that is good in private medical practice.

My enumeration of the necessary interest and participation of health departments in the clinical practice of medicine is not yet completed.

I have stressed the growing conviction of medical officers of health that they are concerned not only in the prevention of illness but also in the prevention of the continuation of illness. This is shown in antituberculosis work. Notification of cases of phthisis began, sanatoria were opened, domestic advice to patients and their relatives was given by health officials before 1911, but in that year a great impetus was given to universal adoption of such measures by generous government grants for the erection of hospitals and sanatoria, and 50-50 grants to local authorities in aid of local activity in antituberculosis activities.

My last illustration is especially significant. Before the Great War a Royal Commission, of which I was a member, was appointed, and early in 1915 we were in a position to recommend that Health Authorities of counties and large boroughs should concern themselves with the setting up of official centers for the treatment of venereal diseases, the central government paying three-fourths and the local authority only one-fourth of the cost of these centers and of diagnostic laboratories. I was then the head of the Public Health State Department concerned in organizing these measures. Very soon a vast network of treatment centers had been initiated. The Local Authorities had imposed on them the direct obligatory duty of starting these, and of arranging that treatment should be given by competent specialists, should be carried out under conditions of secrecy, and that it should be gratuitous, entirely irrespective of the financial or social circumstances of the patient. The success of these measures has been very great, especially in regard to syphilis. But I draw attention to the

fact that this is the first illustration in modern public health administration, in which the treatment of a given disease has been completely socialized—in the sense that treatment is given to every applicant gratuitously, without residential restrictions, and by specialists possessed of special knowledge of the treatment of these diseases.

We need to go back to the early years of the 19th century for an example of a similar measure on a national scale, that of vaccination against smallpox. Now great pox is being similarly treated.

But the difference between these two examples and the rest of medical practice is one rather of degree than of kind.

Infectious diseases, including tuberculosis, are being treated chiefly at the expense of the organized community. A vast amount of midwifery work and of work for infants and school children is being done under somewhat similar conditions.

Do coming events cast their shadows before? I prefer not to prophesy. I prefer not to attempt to suggest that British methods can be applied to American conditions. I refrain even more carefully from drawing attention to the vast extent to which the gratuitous treatment of sickness is practised on this side of the Atlantic. Its amount surprised me when I began to enumerate the American items of such treatment. But my task is completed, for I undertook merely to sketch, in bare outline and necessarily imperfectly in view of limitations of time, the various and multiform ways in which health departments in Britain are concerned in supplementing private medical practice, and in insuring that no sick child or adult fails to secure what the principles of public health call for.



Sanitation and Quality Control in the Fishery Industries*

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THE quality of fresh fish may be lowered by two types of decomposition—enzymic or autolytic and bacterial. The former always occurs even though conditions may prevent bacteria from entering and decomposing the flesh. The fish on boats are usually well iced to keep the counts down, in addition to being very well protected by skin and peritoneum against inroads of bacteria into the flesh. It follows that it would be more sanitary to merchandise fish in the round than in the form of fillets which have no protection against bacterial invasion and are subjected to numerous opportunities for contamination. Nevertheless modern consumer demands require fish to be merchandised in fillet form. The problem resolves itself into getting fish as fresh as possible and then preventing the bacterial decomposition, which decreases its sales life.

Filleting has about trebled the demand for certain species such as haddock, with the result that fish has become so scarce in formerly well stocked haunts as to require trips to fishing banks 700 miles away, although such a trip takes about 12 days allowing for only 6 days actual fishing. From such a trip the oldest fish are about 9 days old upon arrival in market, while the youngest are 3 to 4 days old. Bacterial analysis proved unsatisfactory for differentiating between fresh and stale fish because a 9 day fish is of low quality even though the flesh is practically sterile. Autolysis proceeds regardless of bacterial count and is more responsible than bacterial decomposition for the low quality of much of the fish landed. The electrometric titration test of Stansby and Lemon, which presumably is a measure of the loss of natural buffering effect caused by autolysis, has been investigated. Our experiments indicate it to be suitable for rapidly grading large quantities of fish according to quality.

This paper is presented in two phases, the first being a critical examination of the freshness test, the second describing some sanitary aspects of commercial fish production.

STANSBY AND LEMON FRESHNESS TEST

Because of the great difference in the quality of fish landed from the same boat it is obvious that some method of distinguishing different grades of quality is necessary. Up to the present time the quality of fish has been determined largely by appearance which varies with the care used in handling rather than with age. Autolysis induced by age is more responsible than bacterial decomposition

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TABLE I

Relation of A and B Values to Quality of Fish

When B-value is below 8 and	A = 26 +	quality = excellent
	A = 24 to 26	quality = very good
	A = 22 to 24	quality = good
	A = 20 to 22	quality = fair
	A = below 20	quality = fair
When B-value is 8 to 10 and	A = 26 +	quality = very good
	A = 24 to 26	quality = good
	A = 22 to 24	quality = fair
	A = 20 to 22	quality = poor
When B-value is above 10 and	A = 26 +	quality = good
	A = 24 to 26	quality = fair
	A = below 24	quality = poor
When B-value is above 16	A = . . .*	quality = poor

* When the B value is over 16 the quality is usually too poor to use regardless of the A value.

for loss of quality in iced fish. Hence we have made an investigation of the Stansby and Lemon[1] electrometric titration by which they were able to establish the number of days iced haddock had been out of the water. This study has resulted in commercial use of the titration for grading haddock. Although further work is now being done to calibrate the test for other fish it is that on haddock that is here reported.

Briefly, the Stansby and Lemon titration test is as follows:

1. Titrate electrometrically an aqueous solution of 5 gm. of fish with $\frac{N}{60}$ HCl to a pH of 6.0. The number of c.c. of acid required, being recorded as the B value, is claimed to represent the amount of bacterial decomposition.

2. Titrate from a pH of 6.0 to a pH of 4.3, the number of c.c. of acid required being the A value which is said to represent the autolytic decomposition. We have found no constant relation between the A and B values and for practical purposes it has been found advisable to consider only the A value. However, the B value cannot be entirely disregarded, especially when high. In fresh fish B values may range from 1 to 8; above 8 they take on a definite significance.

The calibration of the method for use on haddock consisted in comparing the quality of fish as determined by cooking tests with the results of the titration test. The outcome of this preliminary work established temporary standards of quality as indicated in Table I.

In order to prove that the above standards of quality would actually work, an extended practical test was conducted including a sufficient number of samples to provide adequate statistical analysis. Samples of fish were graded by an expert buyer and then filleted, one fillet being given to the investigator to be tested electrometrically, the other being frozen and held in storage for a cooking test. The actual grade given by the buyer was withheld from the investigator until the electrometric value was determined. The frozen samples were cooked in the same manner each day during the period of the test and examined by the same group of people participating throughout the period. It is readily seen in Table II that the electrometric titration is as reliable as the opinions of experts. Moreover it provides a numerical value which may be used as a standard of payment for fish on the basis of quality.

The following values were used for comparison of the chemical data with the organoleptic tests.

Excellent A value above 26
Very Good A value between 24 and 26
Good A value between 22 and 24
Fair A value between 20 and 22
Poor A value below 20

The Stansby and Lemon electrometric titration having proved practicable and accurate in the preliminary tests, it remained to be put into actual practice. Previous work indicated that the time required to make a test was approximately 25 to 30 minutes but that much of this time was occupied in the preparation of the sample because it had to be thoroughly mixed. By using a Buffalo chopper for grinding and mixing and by means of a 4 sample set-up connected to a multiple switch (Figure I) it was found that 4 samples could be tested in a minimum of 36 minutes. Even this is deemed too slow for commercial use so that at present there is under construction an apparatus by which it is expected to make possible the automatic titration of several samples simultaneously and to cut the average handling time to less than 5 minutes per sample.

STATISTICAL ANALYSIS OF DATA

The data obtained upon individual samples indicated in Table II were subjected to a thorough statistical analysis by O. E. Sette, in charge of the North Atlantic Fisheries Investigations for the U. S. Bureau of Fisheries. His analysis indicated that so much variation in quality existed in a boatload of fish that at least 80 individual fish would have to make up the composite sample for testing. This proved both uneconomical and time consuming. Moreover, in practice, business on the Boston Fish Pier is usually carried on in units of cartloads of about 2,000 lb. each. A third test was conducted therefore to determine the size of a sample necessary to represent the quality in a cartload of fish. Twenty individual fish from each of 5 cartloads were selected from 20 different locations in each cart.

The Standard Deviation (δ) for the A value of the above test was 1.06 c.c. for 5 carts and 1.16 c.c. for 4 carts. This latter figure was used in making further calculations. Thus to obtain a representative sample whose mean would lie within 1.0 c.c. of the true mean value 95 per cent of the time 5 fillets proved to be the right number to use as a sample. These should be from 5 different fish however. With this size sample a true mean value 2.0 c.c. below the experimental mean value would occur only once in 20,000 times. In our second test (Table II) we had already established an A value of 22.0 as the lower limit of quality acceptable for freezing for long term storage.

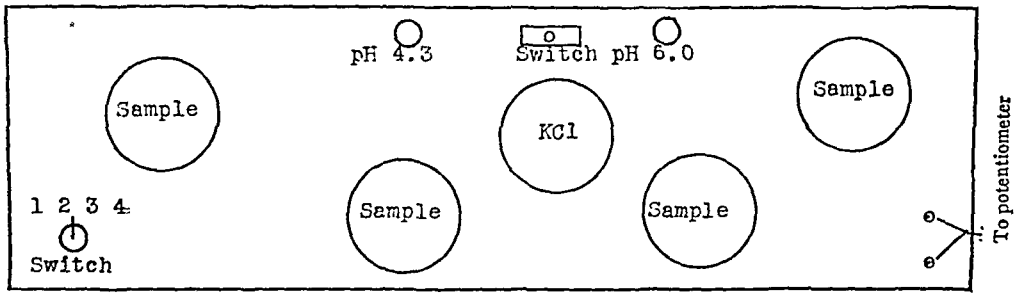
To interpret the above results, let us

TABLE II

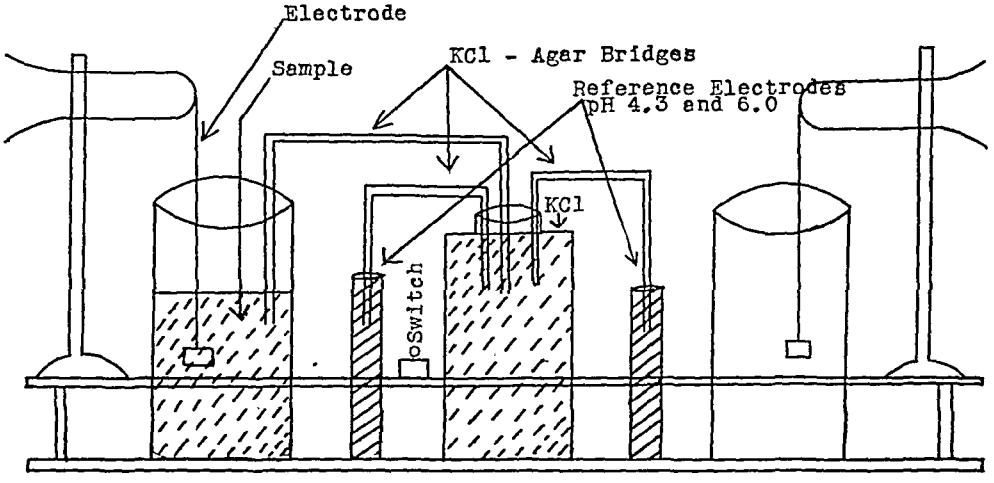
Chemical Versus Organoleptic Grading

	Grade Given by Professional Buyer		*Chemical Analysis*		*Cooking Test*	
Grade	*No. Samples*	*Per cent*	*No. Samples*	*Per cent*	*No. Samples*	*Per cent*
Excellent	6	5.0	2	1.6	2	2.1
Very Good	7	5.7	21	17.5	9	9.6
Good	50	41.7	52	43.3	47	50.5
Fair–Good	17	14.1	..		..	
Fair	28	23.3	32	26.6	25	26.8
Poor	12	10.0	13	10.8	10	10.7
Total	120		120		93	

FIGURE I—Four Sample Hook-up for Freshness Test



TOP VIEW



SIDE VIEW

assume we obtained in the actual testing for each of 100 carts of fish, the border-line value A = 22.0. In the light of the above statistical analysis we would then know that the true mean value of all the fish in these carts would not be below A = 21.0 nor above A = 23.0 and then only 1.25 per cent of the fish would have a true A value below 21, and only 0.4 per cent would have an actual value below A = 20.0. Thus if we obtain a value A = 22.0 in actual practice we can be positive that on the average not more than 2 fish in a cartload would actually be of poor quality even though A = 22.0 is the lower limit of quality.

The above test is now used only for haddock, but the work is well along on cod, red perch (rosefish), pollock, and other species. However, it is a little premature to suggest that the method may revolutionize the purchase of fish generally throughout the industry.

SOME SANITARY ASPECTS OF COMMERCIAL FISH PRODUCTION

SANITARY CONDITIONS AT SEA

Practically all fish, except mackerel and red perch (rosefish), are gutted at sea. This method prevents anaerobic putrefaction of the intestinal contents during stowage, but it smears all surfaces with the intestinal bacteria. These remain and multiply on the surfaces but do not work their way into

TABLE III

Bacterial Condition of Fish as Landed

Sample No.	Slime (a)		Flesh (b)		
	Back	*Nape*	*Back*	*Nape*	*Gills* (a)
1	3,021,000	1,035,000	2,000		
2	5,000,000	415,000	2,000	1,650	
		1,000,000	7,000*		
3	25,000,000	1,045,000	2,900	650	
4	1,430,000	196,000	2,900	2,300	
5	960,000	81,000	7,300	1,600	
6	10,200,000	6,600,000			3,050,000
7	9,600,000	6,000,000			2,400,000
8	9,300,000	3,800,000			2,000,000
9	545,000	430,000			

(a) Counts per gm. of slime, etc., scraped from surface with sterile knife.
(b) Counts per gm. of flesh; contamination into the flesh being due presumably to the method of handling aboard vessel by means of forks.
* 5 days in ice water.

the flesh to any appreciable extent, so that most of them can be washed off or disinfected. This is illustrated in Table III.

PRECAUTIONS PRIOR TO FILLETING

The microbiological condition of the surface decides the degree of contamination of the plant equipment and the final products. Two washes and a scaling usually are given to remove such surface contamination. The wash water usually contains a residual of 1 to 2 p.p.m. of chlorine. For obvious reasons it is desirable to wash the whole fish outside the plant. Table IV shows that it is desirable to pass the whole fish through at least 2 different chlorinated washes before bringing them into the plant. The gills are not easily cleaned in this manner and the bacteria beneath the scales cannot be removed except by removing the scales or skinning the fish. Table V

TABLE IV

Results from Washing Whole Fish

Back		*Nape*		*Gills*		*Per cent Decrease*			
Before	*After*	*Before*	*After*	*Before*	*After*	*Back*	*Nape*	*Gills*	*Remarks*
10,200,000	1,150 000	6,600,000	730,000	3,050,000	2,130,000	89	89	30	3 Washes, middle 6.5 p.p.m. Cl_2
9,600,000	1,040,000	6,000,000	700,000	2,400,000	2,250,000	89	89	6	1 Wash, 6.5 p.p.m. Cl_2
9,300,000	600,000	3,800,000	440,000	2,000,000	650,000	94	88	68	Soaked 5 min. in 6.5 p.p.m.
5,555,000	545,000			1,675,000	190,000	91	..	89	3 washes, 1st & 3rd in 6.0 p.p.m. Cl_2
11,900,000	2,900,000			2,100,000	225,000	82	..	89	Same as above

indicates that *E. coli* when present cannot be consistently removed even by holding 2 minutes in water containing a residual of 100 p.p.m. of chlorine. Hence, beyond the amount necessary to keep the water sterile there may be only slight advantage in the use of chlorine on whole fish. A thorough washing is most effective (Table IV).

As fish are scaled the scales should be removed with strong sprays of clean water as the scaled surface will remain highly contaminated otherwise. Removal of scales before washing facilitates cleaning. This is illustrated by a case where the bath in 6.0 p.p.m. chlorine reduced the count from 487,500 to 33,750 on the surface where the scales were not removed and to 4,750 on the surface where the scales had been removed. Regardless of the many washings some slime still oozes from the pores. Thus even though the fish has been scaled and washed, further contamination of the equipment is caused by this slime.

TABLE V

Effect of Washing in Hypochlorite Solutions on E. Coli

Parts/Million Chlorine		*Gas Tubes Lactose Broth*		*Confirmation on E.M.B. Agar Plates*	
		Before	*After*	*Before*	*After*
10	Back	Positive	Negative	Positive	Negative
	Gills	Negative	Negative	Negative	Negative
15	Back	Positive	Positive	Positive	Negative
	Gills	Positive	Negative	Negative	Negative
25	Back	Positive	Positive	Positive	Positive
	Gills	Positive	Negative	Negative	Negative
30	Back	Positive	Positive	Positive	Positive
	Gills	Positive	Positive	Positive	Positive
40	Back	Positive	Negative	Positive	Negative
	Gills	Positive	Negative	Positive	Negative
50	Back	Positive	Negative	Positive	Negative
	Gills	Positive	Positive	Positive	Positive
75	Back	Positive	Positive	Positive	Positive
	Gills	Positive	Positive	Positive	Positive
100	Back	Positive	Positive	Positive	Positive
	Gills	Positive	Positive	Positive	Positive

PRECAUTIONS AFTER FILLETING

Birdseye [2] has shown how necessary it is to use extreme care throughout the filleting process to keep the counts down in the final products. For comparative purposes his data are given as follows (counts representing 1 gm. of slime scraped from the surface with a sterile knife): (1) Original slime count 3,021,000; (2) after washing in 6.0 p.p.m. of chlorine—1,035,000; (3) after being iced and held 15 hours at 32° F.—1,853,000; (4) after passing through scaler, (a) back, 2,140,000—(b) nape, 911,500; (5) slime on surface of cut fillet, 1,400,500; (6) count per gm. of same meat 153,900; (7) slime of fish after contact with conveyor—2,067,000; (8) count per gm. of same meat 144,600; (9) slime of fillet after brining at 35° Sal. and 2 p.p.m. residual chlorine—97,600; (10) count per gm. same meat 77,450; (11) count per gm. meat of fish 24 hours after freezing and storage at —20° F. 31,950.

A similar survey was made during a commercial operation in another manner by swabbing surfaces exactly 100 sq. cm. in area of skin, fillet, conveyor, table, etc., and placing swab in 11 c.c. of 0.8 per cent saline solution in sampling bottles which are packed in ice and diluted and poured 2 to 5 hours later. The results are the average of 7 to 10 swabs for each test and are given in count per 100 sq. cm.: (1) whole fish just before scaling, 60,620; (2) whole fish just after scaling, 55,750; (3) whole fish on belt after spraying scales off, 61,780; (4) fillets after skinning, 67,610; (5) fillets after belt travel to brine, 73,830; (6) fillets just after brining in 2 p.p.m. chlorine and 20 per cent salt for 7 seconds, 61,595; (7) fillets in pan after weighing, 92,200; (8) wrapped fillets, 151,800. It is obvious that the count takes a decided jump when handled, and that the packers and weighing and wrapping facilities may undo an otherwise excellent job if overlooked as a source of contamination.

BACTERIOLOGICAL STANDARDS FOR PRODUCTION

A total count of 100,000 on the frozen fillet after 48 hours' storage is considered feasible to set as the practical maximum, and whenever the count on the daily sample exceeds this amount it is usually held in 0° F. storage until it is reduced to this amount. Thus the housewife should always receive fish which will remain fresh for a relatively long time after defrosting. The brine tank is a critical piece of equipment. Small pieces of fish absorb the chlorine and decrease its effectiveness and it may become a cesspool of contamination. In heavy production an endeavor is made to maintain 5–7 p.p.m. of residual chlorine. It is estimated that 2–3 p.p.m. would be sufficient, however, to keep the brine sterile if an automatic chlorinator control is accompanied by efficient filtration of the brine. Since the fish can remain in the brine only 10–20 seconds no real disinfection is possible. In fact it is not feasible to allow the fillets to remain long in contact with chlorine because of the undesirable yellow color and salt fishy flavor that develops subsequently during frozen storage.

SIGNIFICANCE OF THE DATA

Griffiths and Fuller[3] found *E. coli* in practically all fish fillets in the open market. Table V indicates how difficult it may be to keep such contamination out of the plant. The source of course is the men on the boats, the wharves, and in the plants, fortunately a very healthy race of men. All fish except oysters and quahaugs are cooked before being eaten. Therefore the presence of *E. coli* in fish fillets loses much of its significance. The total count must be kept down as a low count means continuous satisfaction while high counts very markedly shorten the period of edibility after defrosting.

The use of chlorine is of even greater significance in the packing of cooked shellfish meats such as lobster and crab. The secret of success is to sterilize the meat during the cooking process and thereafter prevent contamination. This is very difficult in practice because the incoming material must be kept strictly separated from the cooked material and the utensils used for handling it. The workers must continually dip their hands, knives and utensils into chlorinated water. It is almost necessary to build a plant of special design to suit such requirements. Our control of quality in shellfish will be the subject of a subsequent paper.

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NOTE: Grateful acknowledgment is made to William T. Murray, who furnished some data, Nathan H. Sanderson, Jr., who directed the "swab count" survey, and to Commissioner Frank T. Bell of the U. S. Bureau of Fisheries, who coöperated by assigning Maurice E. Stansby to assist in getting the investigation off to a good start.

Food Poisoning

DURING recent years the number of organisms proved to be capable of giving rise to food poisoning in one or other of its forms has greatly increased. Since the isolation of *B. enteritidis* by Gaertner in 1888, followed 10 years later by the isolation of *B. aertryeke,* or *Bact. typhi-murium* as this organism is now called, by Durham in England and de Nobele in Belgium, both organisms being undoubtedly responsible for cases of food poisoning, at least 27 members of the Salmonella group have been identified with actual outbreaks of food poisoning in human beings. . . .

As has been indicated the Salmonella group consists of a large number of organisms and new types are continually being added to the list, but the commonest type in food poisoning outbreaks is undoubtedly *Bact. typhimurium* (*B. aertryeke*). During the years 1923–1933, the Ministry of Health found this organism in 110 out of 186 food poisoning outbreaks, in 22 out of 43 in 1934, and of the 46 outbreaks which occurred in 1935 in which the causative organisms were actually isolated, 29 were due to *Bact. typhimurium*. The next most frequently isolated is *Bact. enteritidis*. These facts are rather significant and are of some importance when the cause of outbreaks comes under investigation.—E. R. Jones, M.D., D.P.H., F.I.C., Senior Pathologist, Kent County Council. *J. State Med.*, July, 1937.

International Coöperation in Hygiene*

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THERE can be no quarrel with the statement that public health is advancing. Signs and symptoms of its progress appear on every side. But progress is a relative term, and it is pertinent to ask whether public health is keeping abreast of the march of science on the one hand and the changing needs and conditions of life on the other. For public health is no abstraction, being intimately related to the life of the people and the world in which they live and move. Measured in absolute terms, international cooperation in hygiene has advanced rapidly in the last two decades. In comparison with world progress, with the march of civilization, the rapidity of its advance is seen to leave something to be desired. For we are living in a world which is shrinking visibly and steadily, year by year and day by day. It is primarily a physical shrinking bringing points which were once distant nearer and nearer together and making neighbors of once remote peoples. The secret places of the earth are yielding up their mysteries to the machine. There is now a settlement at the North Pole; airplanes have flown over Mt. Everest; the desert has yielded up its secrets to tractors.

Within a few months the countries of Europe will be almost as near to us as California—the regular service of seaplanes across the Pacific has brought the East to our very doorstep. Those of us who can remember the turn of the century appreciate that we are living in a world which has been, and still continues to be, radically transformed by the ever increasing speed of travel and communication. This world physical shrinkage has brought in its train many by-products. Isolation is no longer possible anywhere. Eternal vigilance must be exercised to prevent the spread of disease. No human vigilance can prevent the spread of ideas which, reaching from country to country and from continent to continent, have transformed the world of thought. Ideologies which a few years ago would suffuse only slowly through national frontiers now leap such obstacles with the speed of light. The members of the human family are having the fact of their close relationship forced on them every day.

WIDENING OF THE INTELLECTUAL HORIZON

At the same time that the physical world is shrinking, the intellectual world is enlarging. The exploration of nature is adding new facts to our store faster than we can assimilate them. Busily engaged in digesting those facts, we have little time and less ability to add them together and to examine the product. While the pressure of new knowledge is forcing us to alter many of our conceptions of the world about us, we yield up our old ideas, prejudices,

* Read at a Special Session of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

and opinions but slowly. This is particularly true in the field of international relations, where the old idea that every nation is the antagonist of every other nation and that the citizens of any given nation are so superior to the citizens of any other nation that they must at all costs multiply and inhabit the earth, by fair means or foul, usually the latter, is still the predominating national doctrine. A few leaders, like our own Secretary of State, speak convincingly of the need for international harmony in economics, politics, and social affairs. Their voices are in danger of being drowned by the rattle of the machine gun, the bursting of bombs from the sky, and the explosion of mines.

GROWING COMPLEXITY OF THE MODERN WORLD

A third phenomenon is the increasing complexity of the New World in which we live, and the fact that we still behave very much as if we lived in the last century. I have already spoken of the spread of ideas, many of which are regarded as patriotic in one country and subversive in another. But the complexity of the world is due mainly to the increasingly dense network of social, economic, and political interrelationships which caused the murder of an archduke in far away Sarajevo to bring on a war which affected every single inhabitant of the globe. Almost no human action is without its remote repercussions.

GROWTH OF INTERNATIONAL COÖPERATION INEVITABLE

The lessening size of the world and the increasing complexity of life led inevitably to the growth of international coöperation of which coöperation in hygiene is only a part. Commerce has forced the nations to cooperate in finance and economics, and in weights and measures. Science, industry, and other forces have compelled them to coöperate in other fields. They have been reluctant to coöperate. They have prized their isolation. They have wished to remain independent to retain their sovereignty unimpaired. Some of the so-called most enlightened governments fought international cooperation to the last ditch—some are still fighting it, as Don Quixote fought windmills. But the hard facts of the machine age and the industrial revolution cannot be denied. Coöperate or perish are the two horns of the dilemma. There is no alternative, no other path of escape.

I believe that the world today is turning, perhaps very slowly, toward the alternative of coöperation. The progress of international coöperation in health matters illustrates the trend in that direction.

LIST OF INTERNATIONAL HEALTH ORGANIZATIONS

In 1910 there were no official international health organizations in existence. What is the situation today? Every American knows that there is a Pan American Sanitary Bureau which facilitates the coöperation of American countries in health matters. The prevalence of yellow fever and plague on the American continents, and the multiplying facilities for their spread from one country to another prove the need for such coöperation. But the Bureau is reaching into a wider field, and little in the modern health program is foreign to it. An international maritime and quarantine board at Alexandria stands guard over the Suez Canal and supervises the Mecca pilgrimage in the interests of disease prevention. The International Austral-Pacific Bureau at Melbourne assists health departments in that region to coöperate in disease prevention and health promotion. The International Public Health Office at Paris is perhaps the

most important organization of its type; it is independent and specialized, not forming part of any larger organization, and restricting itself to the preparation and application of international conventions having for their purpose the prevention of the spread of disease. More than fifty-five governments adhere to the Rome agreement by which it was created, and it cooperates with the other international health organizations which I mention in this report.

Still another international organization concerned with health is the International Labour Office. While the object of the League is to prevent war between the nations, the aim of the International Labour Office, of which this government is a member, is to prevent war between the social classes by measures to improve the health, safety, and economic security of the wage earners in all countries. For the absence of international agreement on such measures, leads inevitably to ailing industry, low wages, violence, and strikes. The situation in the textile industry is a striking illustration of what happens when there has been no such international agreement. The International Labour Office is concerned with industrial hygiene, occupational diseases, housing, maternal and child welfare, medical care, and many other subjects in the field of health. Workers and their families constitute the largest single element in any population, which gives great importance to the work of this organization. In the field of health it coöperates closely with the League.

HEALTH WORK OF THE LEAGUE

The two international health organizations which I propose to describe in somewhat greater detail owe their existence to the League of Nations by which they are controlled and financed. They have opened up new avenues of coöperation between the nations, and during their relatively short existence they have grown steadily in importance and prestige.

The first of these is the International Health Organization at Geneva, which forms an integral part of the League of Nations structure. Founded almost as soon as the League itself took form, it has taken the whole world for its territory, finding that international health coöperation could not be restricted to the fifty-nine governments which have adhered to the League Covenant. Important non-League members, like the United States, Germany, and Japan, coöperate with this organization. It is natural that this should be so for in the prevention of disease and the promotion of health it is impossible to restrict action to countries which belong to the League.

The other organization is really a part of the first as its name denotes—it is the Eastern Bureau of the League's Health Organization at Singapore. These two organizations have made history in the field of international relations. They have helped to clear a pathway along which governments may proceed in other fields, for in international as in national affairs, public health administration is intimately related to administration in general. The lesson that the complexity of the modern world has increased the interdependence not only of governments, but also of every function of a single government, is being pressed home steadily at Geneva.

PROGRESS IN INTERNATIONAL HYGIENE

What progress in world public health stands to the credit of these two international health organizations?

In the first place they have been a tremendous help in the efforts of governments to prevent the spread of the major epidemic diseases. This is per-

haps best illustrated by the service of epidemiological intelligence established at Singapore. All the important national health administrations in the Far East report to Singapore by the most rapid means, usually the cable, the movement and prevalence of plague, cholera, dysentery, smallpox, and typhus fever in their ports and within their borders. Singapore in turn digests and assembles this material and broadcasts it from ten wireless stations at daily and weekly intervals so that every health officer in that wide area may take action based on the most recent and accurate reports.

Those who are interested in this service should read recent League bulletins on the march of cholera in the Shanghai, Hong Kong, and Swaton area, a painful reminder that our success in preventing great epidemics is restricted to periods of peace between the nations.

Coördination of research in preventive medicine has been one of the outstanding successes of the League. I need mention only a few examples. Some thirty preparations widely used in medicine are now subject to international standardization. The stable standard preparations are preserved by national institutes at London and Copenhagen on behalf of the League. Samples of these standards are sent out periodically to national health administrations, and samples of national standards are examined routinely at London and Copenhagen to see how closely they conform to the international standard. The list includes such sera as diphtheria antitoxin and dysentery serum, such vaccines as tuberculin, organ extracts such as insulin, pituitary, adrenalin, pharmaceutical products like digitalis and strophanthus. Four of the vitamins are included in the list, demonstrating that progress in medicine has not been allowed to outpace the international machinery for the coördination of the results of medical research.

Such coördination has been extended to other fields. Several groups of malariologists in a number of countries are studying the effects of the new synthetic remedies used in the treatment and prophylaxis of malaria according to a plan carefully worked out by a League committee. Recently there met at Geneva for the first time a group comprising all those who had made any contribution to the prevention of typhus fever and, if time permitted, I could give you many more examples of this attempt to coördinate the results of national research in the field of preventive medicine.

International health organizations use various means to accomplish their ends. The preparation, adoption and ratification of a convention is the traditional method. But as international coöperation in this field has progressed, less formal means have become more and more important. In the first place among these are measures to promote the exchange of national experience and information on as wide a scale as possible. Recognition of the important part played by this exchange has led to the organization of specific means to promote it. As far as the League is concerned, it has facilitated the studies abroad of more than seven hundred public health officers. Many of you have felt the influence of this system. In 1935 and 1936 groups of European and Latin-American public health officers visited this country under the auspices of the League. They learned much from you. Would it be wrong to claim that they also gave much to their American hosts? The impressions of the first group have been set out in a report which some of you have seen, *Public Health and Social Problems in the United States of America*. The report of the second group, on the teaching

of hygiene in this country, will shortly be considered by a commission comprising the directors of most of the important schools of hygiene in the world. I am sure that the report of that commission, based as it will be on detailed studies of European and American schools, will be a real contribution to the subject.

The real task of an international health organization is not so much to carry out direct work as it is to provide opportunities for the national health administrations to coöperate among themselves. The Singapore Bureau of the League permits the governments to exchange timely information on the prevalence of disease. Health officers from other countries are given the opportunity to study in detail the effective campaign waged against syphilis in Denmark and Sweden. Any government which wishes to do so may take advantage of the facilities available at the International Leprosy Research Center at Rio de Janeiro. And when a government desires to reorganize or reform its health administration it may, through the League, obtain the disinterested advice and assistance of the best public health and medical experts from other countries.

Greece and China are among the countries which have availed themselves of that opportunity, and while the splendid results obtained in China are due primarily and essentially to the Chinese, they would be the first to acknowledge their indebtedness to the wise counsel of League experts who spent months studying the local conditions and deliberating with their Chinese colleagues on the most suitable plans and policies.

One result of their deliberations was the request for League assistance in the whole field of national reconstruction, general education, economics, finance, transport, agriculture, etc. They realized that the various elements in national economy and reconstruction are interdependent—one activity cannot progress normally while another lags. It is a lesson which many others need to learn.

The recent international campaign for better nutrition is a sign that the League itself has learned that lesson. At first the different League organs carried on their work as though their problems formed entities, separate from and independent of all other problems. When the problem of better nutrition was finally tackled, this isolation of specialists soon went by the board, as the complexity of the problem became evident. For the success of a policy to improve nutrition depends upon agriculture, transport, wages, tariff barriers, import quotas, exchange restrictions, national security, and armament policy just as it depends upon the efforts of public health specialists.

One by-product of international cooperation in hygiene has been the broadening of our conception of the public health field. By accident or tradition, public health or preventive medicine means one thing in one country and something else in another. Health authorities in this country pay little attention to housing, which is the most engrossing task of the English Ministry of Health. Provision for medical care is considered fundamental by one national health administration while another makes no attempt to deal with it. Improvement of physical education is a chief plank in the public health platform of one country while in another it is completely ignored. I do not ask that we in this country should broaden our program to include all subjects which are comprised in the public health policy of other countries. But I do believe that the existing agencies for international coöperation give us an opportunity to study those policies as they are prac-

tised and, if advisable, to adapt and readjust our own programs.

I have been closely associated with the League for 12 years and I firmly believe in its covenant, in its work, and in its methods. Only human frailty stands in the way of its immediate success. I believe that the triumph of League principles will ultimately solve the world's most serious problems. Holding firmly to that belief, I consider it the duty of every right thinking person to help on the cause of international coöperation in his own field of work. International coöperation in hygiene has paved the way for coöperation in economics, finance, and even in politics. Those of us who are concerned in health work can do our share by giving every encouragement to existing international health agencies. We have much to learn from their publications, and where possible from active participation in their work. The best contribution we can make is to bring our own work to the highest possible level, so that it may serve as an example to others.

By an intensive campaign against syphilis Denmark and Sweden have furnished a striking example of what can be accomplished against that disease. Our own Surgeon General has brought the lesson home to this nation. And America has contributed much to world public health progress by precept and example. American specialists have sat on nearly every important international committee concerned with health, and have made fundamental contributions to their work.

Every student of world affairs or even of national affairs realizes that one of the chief problems of the day is to raise the level of the standard of living throughout the nation and throughout the world. Social unrest in any country is a danger to peace.

The League, the International Labour Office, and many of the other international organizations are engaged in the task of improving health, largely by means calculated to achieve that object. For the safety of the world against aggression lies not so much in disarmament and the negotiation of treaties; it is based upon more fundamental considerations such as social security, sound economics, good health, and comfortable and healthful living conditions. In the endeavor to bring about these reforms, the members of this Association have an important part to play without going out of their own field which is the promotion of health. In so doing they will have the satisfaction of knowing that they are contributing to the progress of mankind along the road to peace.

Relationship of the Diet to the Self-Regulatory Defence Mechanism*

II. Lysozyme in Vitamin A and in Uronic Acid Deficiencies

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MANY factors contribute to the self-regulatory defence mechanism of the gastrointestinal tract. The authors have shown in the preceding paper of this series changes which occur in the bacterial flora and pH of the intestinal contents of rabbits fed on diets containing dehydrated apple.

In this report, we wish to present data showing the effect of dehydrated apple on the lysozyme content of the tissues and secretions of rabbits on vitamin A deficient diets and rabbits depleted of their reserve of uronic acids.

The rôle lysozyme plays as a defence mechanism of the eye [7, 8, 10] has been very thoroughly investigated. Since lysozyme is found in practically all secretions of the mucous membrane, we believe that it may be a factor of great importance in the intestinal self-regulatory mechanism.

HISTORICAL

Lysozyme was first described by Fleming [1] who found that tears had the property of dissolving or lysing organisms isolated from the air. Later Fleming and Allison [2] reported finding this same lytic agent in practically all human tissues and secretions except cerebrospinal fluid, normal urine and sweat. They concluded that lysozyme was especially active against non-pathogenic organisms and that this was the reason these organisms were non-pathogenic. Later workers, however, found that while lysozyme did not always cause lysis of pathogenic organisms, it did in many cases act as a bactericidal or bacteriostatic agent. In fact, few if any pathogenic organisms are totally unaffected when brought in contact with lysozyme. Fleming believes that lysozyme is the body's only natural defence mechanism and that immunity is acquired through its help.

Findlay [14] and Anderson [15] found that in both animals and humans deficient in vitamin A there is a diminished lysozyme content of the tears. They also found that the xerophthalmia present could be cured by local treatment with lysozyme.

Ridley [6] found that in epiphora there

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was a lowering in lysozyme titer and that following this lowering, infection in the affected eye could occur.

Hilding [12] determined the lysozyme content of nasal mucus and found that there was a loss in lytic power preceding a cold and during its course. An increase in lytic power was found to precede improvement in symptoms.

Wolff [3, 4] and Kigasawa [5] and Meyer, Thompson, Palmer and Kharazo [18] produced purified lysozyme from egg white and investigated its chemical properties. They concluded that lysis cannot be explained on a physical basis, *e.g.*, lowering of surface tension. Lysozyme has no protease, kinase, amylase, lipase, or phosphatase activity. It liberates reducing sugars from mucoids or polysaccharides of susceptible organisms. Lysozyme is apparently a basic polypeptide whose optimum activity is at a neutral pH. It is destroyed by heat and retained by filters.

Rosenthal and Lieberman [9] found that infants fed cow's milk did not have lysozyme in their stools. Infants fed breast milk did, however, have lysozyme in their stools. They also found that lysozyme inhibited the growth of *Esch. coli* but not *B. bifidus*. Human milk contains lysozyme while cow's milk does not. Blatt and Kessler [16] have since confirmed their findings.

Goldsworthy and Florey [13] determined the lysozyme content of the tissues and secretions of various animals. They found that the rabbit has a high lysozyme content in mucus from the colon. Cat tissue is poor in lysozyme, but the saliva is very high. Goats, however, had no lysozyme in saliva but a great deal in tears. Since our work began, Prickett, Miller, and McDonald [23] reported finding an increase in lysozyme in tissues of rats on a vitamin A deficient diet.

There has recently been published a symposium on lysozyme by Melnik, of the Ukrainian Metchnikoff Institute.[17] These workers found lysozyme to be active in varying degrees against practically all pathogenic organisms. They also found that organisms lysed served as immunizing antigens as well as if killed by other means. In some cases the lysed organisms served as better antigens than those killed by heat.

EXPERIMENTAL

Rabbits were used as the experimental animals and were divided into 6 experimental groups, namely (N) pellet diet, (A) pellet diet plus dehydrated apple,* (AD) vitamin A deficient diet, (AAD) vitamin A deficient diet plus dehydrated apple, (M) rolled oats plus vitamins plus menthol (3 gm. per kg. of body weight daily), and (MA) rolled oats plus vitamins plus menthol (3 gm. per kg. of body weight daily) plus dehydrated apple (20 gm. daily). Lysozyme determinations were made of the tissues at the 5 different levels of the intestinal tract previously investigated for hydrogen-ion concentration and bacterial flora, namely, duodenum, jejunum, ileum, cecum and colon.

The test organism used was a Sarcina obtained from Dr. Richard Thompson and found by him to be an excellent indicator of lysozyme activity. The method used for testing the lysozyme content of the tissues is as follows: The animal is killed by a blow and tissues immediately removed and placed in absolute acetone. After remaining in acetone 48 hours, the tissues were removed to a desiccator until thoroughly dry and then ground to a powder. This powder was then

* The dehydrated apple was in the form of a powder as originally prepared in this laboratory and described in earlier publications. A complete description of the diets used occurs in the first paper of this series.

TABLE I

Average Lysozyme Titration for (N) Normal Group (6 Rabbits)

1 Hour Incubation

Level	*No Lysis*	*25% Lysis*	*50% Lysis*	*75% Lysis*	*100% Lysis*
1. Duodenum	1:66	1:33			None
2. Jejunum	1:66	1:33			None
3. Ileum	1:91	1:41			None
4. Cecum	1:250	1:150	1:100	1:55	1:4
5. Colon	1:5,700	1:3,200	1:1,200	1:750	1:300

TABLE II

18 Hour Incubation

Level	*No Lysis*	*25% Lysis*	*50% Lysis*	*75% Lysis*	*100% Lysis*
1. Duodenum	1:83	1:41			None
2. Jejunum	1:83	1:41			None
3. Ileum	1:110	1:50			None
4. Cecum	1:500	1:400	1:300	1:200	1:17
5. Colon	1:19,000	1:15,700	1:12,000	1:8,000	1:3,200

weighed and extracted with physiological saline for 24 hours. Progressive dilutions of this extract were put in serological tubes in 0.5 c.c. amounts and mixed with 0.5 c.c. of a saline suspension of the test organisms. The mixtures were incubated at 37° C. for 18 to 20 hours and the degree of lysis read, the titer being the highest dilution giving complete lysis.

The lysozyme titer of the gastrointestinal tract of the rabbits in group N was taken as the normal titer. The lysozyme titration was then obtained with the rabbit group (A) receiving dehydrated apple added to basic pellet diet. The purpose of this was to determine if apple caused any change in normal titer. Table I and II show the average titrations for the normal group with 1 hour and 18 hour incubations. The animals in group A gave titers identical with the normal. In order to avoid duplication the data are not given.

It will be noted that of all the levels studied, the colon contained the greatest amount of lysozyme. Because of this, the colon was considered the best indicator of lysozyme concentration and in the following experiments was the only tissue used.

VITAMIN A DEFICIENCY

Two groups of rabbits were fed a vitamin A free diet. One group received in addition dehydrated apple *ad lib.* After the A deficient group showed signs of severe depletion, the animals in both groups were killed and the lysozyme content of the colon was determined.

TABLE III

Average Lysozyme Titration of Colon of 6 Rabbits Fed Vitamin A Deficient Diets

	Lysozyme Titer of Colon	
Group	*Complete Lysis*	*No Lysis*
AD	1:7,170	1:32,000
AAD	1:3,300	1:19,000

Table III shows the comparative lysozyme titers of the two groups. The group receiving dehydrated apple had a normal amount of lysozyme in the colon, while the group not receiving dehydrated apple had over twice as much lysozyme in its colon tissue. The vitamin A deficient rabbits showed

severe ulcerations of stomach, intestine, and gall bladder, and the liver had many whitish areas. The group receiving the dehydrated apple supplement exhibited no gross pathology. The tissues of both groups were preserved for tissue section and will be reported at another time.

URONIC ACID DEPLETION

Manville, Bradway, and McMinis [25] in reporting the use of pectin as a detoxication mechanism found that animals fed menthol could be protected by the ingestion of pectin. They concluded that the uronic acid present in pectin conjugated with menthol thus sparing endogenous sources of uronic acids such as mucin, chondroitin, heparin, etc. The rabbits fed pectin showed less protein breakdown than the group not receiving pectin.

Since the dehydrated apple used contained a large amount of pectin (5.22 per cent) it was thought advisable to repeat the menthol feeding experiments, using the dehydrated apple as a source of uronic acid. The colons of rabbits fed menthol and menthol plus apple were taken for lysozyme determination. Each group received 3 gm. of menthol per kg. of body weight daily. In addition, one group received 20 gm. of dehydrated apple daily. Within 8 to 12 days, all of the animals not receiving apple were dead. Immediately after death, the colons were taken for lysozyme determinations. After the last animal of the group receiving menthol only was dead, all of the animals in the group receiving menthol plus apple were killed. The group receiving the menthol supplement only showed severe ulcerations of stomach, intestine, and gall bladder, with many whitish areas in the liver. These lesions appeared to be identical to those occurring in the vitamin A deficient rabbits. This is in further confirmation of statements made elsewhere.[24] The group receiving menthol plus apple showed no gross pathology. Tissues were taken for sectioning and will be reported upon at a later time.

In Table IV it will be seen that the lysozyme content of the colons of the animals in group M was almost 4 times the normal, while the lysozyme titer of group MA was normal.

TABLE IV

Average Lysozyme Titration of Colon of 6 Rabbits Fed Menthol

	Lysozyme Titer of Colon	
Group	*Complete Lysis*	*No Lysis*
M	1:12,800	1:40,000
MA	1:3,300	1:20,000

EFFECT OF MUCUS SECRETION ON TISSUE LYSOZYME

Prickett, Miller, and McDonald [23] found that rats fed a diet deficient in vitamin A had an *increase* in lysozyme in the *tissues*. They concluded that this was an attempt to compensate for the deficiency. Furthermore, other workers have found that a vitamin A deficiency *decreases* the amount of lysozyme in *secretions*. Manville believes that there is a relationship between vitamin A and uronic acid metabolism and that a deficiency of either will result in a reduction of mucus secretion. Lysozyme is secreted in mucus and mucus secretion is deficient or absent in vitamin A deficiency and in menthol poisoning. The reason then that lysozyme is higher in the tissues in these conditions may be due to the inability of the body to provide mucus to act as a vehicle of transport for lysozyme. In other words, vitamin A and uronic acid may act as a trigger mechanism in lysozyme secretion. To test this possibility 6 animal groups were used, namely: group NP receiving a pellet diet; group A receiving pellets plus dehydrated apple; group AD receiving vitamin A deficient diet; group

AAD receiving vitamin A deficient diet plus dehydrated apple; group M, receiving 3 gm. of menthol per kg. of body weight daily; and group AM, receiving 3 gm. of menthol per kg. of body weight and 20 gm. of dehydrated apple daily. When the animals were ready for lysozyme determinations, the following procedure was used: the animal was anesthetized with intravenous nembutal, the abdomen opened, and half the colon removed. Immediately after this, 2 mg. of pilocarpine per kg. of body weight was given intravenously. This was allowed to act for 30 minutes and the rest of the colon removed. Both sections of the colon were then tested for lysozyme content. Table V shows the result of these determinations. Those groups which were vitamin A deficient or depleted of their store of uronic acids showed a much smaller loss of tissue lysozyme than those groups fed apple. The normal control group showed the same percentage loss as the groups fed apple.

DISCUSSION

In the self-regulatory defence mechanism no one factor alone can be considered. Arnold,[28, 29] Nedzel and Arnold,[30] Johnson and Arnold,[31] Seidman and Arnold,[32] Arnold,[33] and Bergeim, Hanzen, and Arnold [34] have all shown that this defence mechanism is very closely linked with hydrochloric acid secretion in the stomach and its buffering action in the intestine. They have further shown that the ingestion of certain fruits protect the body from both exogenous and endogenous bacteria, their explanation being that probably this protection comes from

TABLE V

Lysozyme Titrations on Colons of Rabbits Before and After Receiving Pilocarpine

Diet	*Group Number*	*Lysozyme of Colon Before Pilocarpine*	*Lysozyme of Colon After Pilocarpine*	*Per cent Loss of Lysozyme*
Pellet Diet	NP-1	1:3,300	1:1,400	57.6
	NP-2	1:3,200	1:1.500	53.2
	NP-3	1:3,200	1:1,400	56.3
	NP-4	1:3,400	1:1,200	64.8
Pellet Diet	A-5	1:3,500	1:1,400	60.0
plus	A-1	1:3,200	1:1,300	59.4
Apple Powder	A-6	1:3,400	1:1,200	64.8
	A-7	1:3,200	1:1,100	67.6
Vitamin A	AD-7	1:7,500	1:7.000	6.7
Deficient	AD-8	1:8,000	1:7,500	7.3
Diet	AD-9	1:6,000	1:5,000	16.7
	AD-10	1:7,500	1:6,800	9.4
Vitamin A	AAD-1	1:3,200	1:1,200	62.6
Deficient	AAD-2	1:3,400	1:1,100	67.7
Diet Plus	AAD-3	1:3,200	1:1,000	68.8
Apple Powder	AAD-4	1:3,500	1:1,400	60.0
Menthol Fed	M-1	1:10,200	1:8,800	13.8
3 grams per	M-4	1:11,600	1:10,800	7.9
kilogram daily	M-5	1:9,800	1:8,000	17.4
	M-6	1:12,000	1:11,200	6.7
Menthol Fed	AM-1	1:3,400	1:1,400	58.9
3 gm./kilo. daily	AM-2	1:3,200	1:1,500	53.2
plus Apple Powder	AM-3	1:3,200	1:1,600	50.0
20 gm. daily	AM-4	1:3,300	1:1,200	63.7

the organic acids present in the fruit being toxic to harmful organisms. Furthermore, the carbohydrates present promote the growth of a favorable flora. The authors [35] have confirmed these findings in rabbits fed apple in which the pH and bacterial flora determinations of the gastrointestinal tract were made. Arnold and his coworkers have also shown that the stomach and upper levels of the intestinal tract are relatively free of bacteria, probably due to the bacteriostatic action of the hydrochloric acid, while the lower levels have a great bacterial population. Our finding in the lysozyme content of the tissues of the gastrointestinal tract shows that at those levels thus protected the lysozyme content is low. Furthermore, in the lower levels where the acid protection is gone we found the tissue lysozyme to be high. We think it is logical to assume that where one protective mechanism leaves off another takes its place. The mucous membrane of the colon is constantly bathed in mucus high in lysozyme, thus protecting the tissue from bacterial invasion. If for any reason this mucus supply is lowered the lysozyme is also lowered. This condition we found to be true in animals deficient in vitamin A or uronic acid. It is of interest to note that animals so deficient exhibited severe ulcerations of the gastrointestinal tract. We think it reasonable to assume that the body needs these two substances to promote mucous metabolism, the mucus being the vehicle for lysozyme. It would seem that the lysozyme, to be effective as a defence mechanism in the colon, must be in the mucus bathing the surface cells. The increased lysozyme content of the colon tissues in animals deficient in vitamin A and uronic acids is probably due to the tissue continuing the manufacture of lysozyme although being unable to transport it. Lysozyme retained in the tissue is probably inactive, thus allowing a bacterial invasion of these tissues.

The animals receiving diets deficient in vitamin A and uronic acids that were fed supplements of dehydrated apple showed a normal lysozyme concentration in their colon tissues. The normality of these animals cannot be accounted for on the basis of vitamin A alone, as shown by Manville, McMinis, and Chuinard.[26] The dehydrated apple does not contain a large amount of vitamin A, but it is rich in uronic acids. Manville [24] has pointed out the possibility of the uronic acids supplementing vitamin A in mucous metabolism. Evidence that this is true is supported by the similarity in the gross pathological lesions and tissue lysozyme titers of our experimental animals.

Thus there is shown to be an additional self-regulatory defence mechanism with its chief site of operation in the colon. Hydrochloric acid is effective in the upper reaches of the gastrointestinal tract, but the organic acids and lysozyme must be depended upon in the lower levels. Foods, such as the apple, either in the fresh or dehydrated state, are quite essential in the maintenance of this activity.

It is noteworthy that by the time the food residues have reached the lower levels of the intestine, most of the protective influences operative at the higher levels have been removed and the material itself has been converted to its most irritative form. Mucus secreting elements are more richly supplied in the colon than elsewhere. These are stimulated into activity by the mechanical irritation of the intestinal contents. Mucus not only acts as a lubricant and a mechanical buffer but acts as well as a vehicle of transport for lysozyme. May it be that the chain of events characterizing the "irritable colon,"

mucous colitis and ulcerative colitis represent, fundamentally, overstimulation of mucus production with a resultant depletion or exhaustion in lysozyme output?

SUMMARY AND CONCLUSIONS

Lysozyme content of the tissues of 5 levels of the intestinal tract was determined. This showed that in the rabbit, the colon contained many times more lysozyme than the other levels.

The lysozyme titer of the colon apparently cannot be increased beyond normal levels by the feeding of dehydrated apple supplement.

Vitamin A deficient and uronic acid deficient rabbits showed a tissue lysozyme concentration 2 to 4 times greater than normal.

Vitamin A deficient and uronic acid deficient rabbits fed an apple supplement showed a tissue lysozyme concentration that was normal.

Normal rabbits, rabbits fed apple supplement, rabbits fed on a vitamin A deficient diet plus apple, and rabbits depleted of uronic acid but fed an apple supplement when stimulated by pilocarpine lost by mucus secretion over 50 per cent of their tissue lysozyme.

Rabbits fed a vitamin A deficient diet and rabbits depleted of their uronic acids when stimulated by pilocarpine lost by mucus secretion only 6 to 17 per cent of their tissue lysozyme.

Because of these findings, we believe that vitamin A and uronic acids act as trigger mechanisms in the secretion of lysozyme in mucus. Animals deficient in these two factors can still produce lysozyme in their tissue but are unable to utilize it as a defence mechanism.

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NOTE: The authors wish to take this opportunity for expressing their thanks to the Washington State Apple Commission through whose generosity a grant was provided to cover the expenses of this investigation.

Committee to Study Motor Vehicle Accidents

THE importance of our problem can be better comprehended when we realize that motor vehicle accidents are the principal cause of fatal accidents in the age group of 5 to 64 and that, if the present rate of slaughter continues, 1 out of every 20 persons in the United States will be injured or killed in a motor vehicle accident within the next 5 years. An even more startling prophecy is that unless some drastic means of combating traffic accidents is instituted, 2 out of every 3 children now living will be injured in a motor vehicle accident in his lifetime.

In most states no provision is made for the furnishing of evidence of physical or mental fitness of motor vehicle drivers. This condition is particularly deplorable since the National Safety Council has made available to all states a model driver's license code.

The importance of adequate driver's license laws is shown by a 9 years trial. In this time, states having a standard license law have decreased vehicle death rates by an average of 20 per cent, while all other groups of states have increased their death rates, some more than 30 per cent. The committee recommends the adoption of the uniform driver's license law by all states, since this would be an additional factor in traffic safety and would not only give the states some control over the driver with physical and mental defects but would be of additional value in collecting records of the chronic law violators, the reckless, and the "accident-prone."—*J.A.M.A.*, June 19, 1937.

Results of Mass Education for Tuberculosis Prevention in Detroit*

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FOR the purpose of practical convenience to its members, the American Public Health Association has seen fit to establish 10 Sections, and among these is one for public health administration and another for health education. The interests of these two Sections are, however, virtually inseparable. We cannot conceive of a well organized modern health department in which health education and administration are not closely coördinated. Education is the bulwark of health promotion and disease prevention. In most small health departments the health officer himself serves as director of health education; only in the larger cities and in state health departments have full-time specialists with trained assistants been employed. The span of health education in its broadest sense is synonymous with the sphere of public health administration. They are dependent one upon the other. There is no need of giving the public the newer knowledge essential to health promotion unless we provide the facilities to make the services universally available. To teach an individual what he should do and then fail administratively to make accomplishment possible, produces negative results. Every individual who has chosen public health work as his life career must of necessity be a health educator. His usefulness to his community will be enhanced with the development of a knowledge of the technics of health education.

The span of health education begins with facts and statistical knowledge; includes popular health instruction as well as school health education, and extends through the preparation of the professional and educational groups whose obligation it is to influence the behavior and attitudes of those fractions of the public which are in need of a specific service; must include the availability of the service of physician and dentist either through the establishment of centers within the office of the family physician and dentist or in the clinic or dispensary; all available notwithstanding the financial status of the individual. Statistics, preparation, availability, notwithstanding financial status, are all necessary to complete the span of health education and public health administration.

Fortunately, in our field we are not dependent upon hypothetical conjecture or philosophical discussion for the

* Read before the Public Health Education Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

establishment of a firm foundation on which to build our structure of health. The factors which contribute to high morbidity and mortality are in the main well understood by the student of public health. He knows the sequence of cause and effect; that with a specific inciting agent in a favorable environment, a susceptible person may succumb to a specific disease or condition. In most instances sufficient knowledge of the etiology and mode of transmission of infection is already available. In other cases the research institutes and laboratories are continually establishing new facts and statistics.

It is upon these proved and established features that we develop our health education program. In the case of tuberculosis the epidemiologist warns that with the disclosure of a new case we should search diligently for the infecting case. We can see the inciting agent; we know its general influence upon the human host; we know that minimal tuberculosis can be discovered by the use of the tuberculin test and the X-ray examination of the positive reactor. These are some of the facts with which we must mold our program of prevention and with which we must stimulate and promote positive health.

It is a human trait that the average individual credits his fellow being with a health consciousness equal to his own. We are prone to accept complacently the belief that laymen consider tuberculosis a communicable disease, one spread from person to person through rather extended and close contact. The layman in his turn remains lethargic and uncoöperative, believing that the public health officers, the nurses, and tuberculosis association workers have the situation well in hand and that there is no particular need for lay participation. Too many family physicians labor under the delusion that minimal tuberculosis can be diagnosed on a basis of symptomatology—loss of weight, temperature, night sweats, and hemorrhage. We know only too well that these are the signs of advanced and not early tuberculosis. Possessing statistics on the prevalence of tuberculosis, the trend of the death rate, the frequency of the disease by race, sex, occupation, and the like, we must proceed to the preparation of (1) those groups which are to participate in the dissemination of facts, and (2) to the preparation of those fractions of our community which are in greatest need of this knowledge or who are the guardians of children who need the full advantages of preventive technic.

The first to be prepared are those who, like ourselves, have chosen public health as our life career. With a foundation of biology, the physician, engineer, public health nurse, and technician are being trained in the colleges of their specialty and being exposed to the practical application of their theoretical concepts in the fields of public health administration. The American Public Health Association through one of its Standing Committees is alert to our collective responsibility in the training of adequate personnel. There should be no distinction between those of us who are in official and in nonofficial organizations; all have the same objective—the promotion of community health.

There can be no disagreement with the statement that the family physician should practise preventive as well as curative medicine in his own office. It has been amply demonstrated that there are advantages to the public, the individual patient, the physician, and the health department. The public gains by a reduction in the cost of community sickness; the individual gains in the betterment of his own personal health; the physician finds financial profit as well as personal satisfaction in maintaining the health of his clientele, while the health department

can be proud of the downward trend in the incidence of disease and the improvement of the general health conditions of his area. The President of the Medical Society of the State of New York, Charles H. Goodrich, has recently proposed the slogan "every physician a deputy health officer." [1] In some communities this is virtually an accomplished fact. Nine years ago the Detroit Department of Health deputized 1,200 coöperating physicians, practising preventive medicine in their own offices, establishing health centers available to all alike. The health department actually provided a card on which the physician's name was inscribed and which he displayed on the wall of his waiting room, stating that the health department had deputized him to participate in the health program. Such authorization was, however, preceded by a period of preparation in which each physician was instructed with regard (1) to the administrative plan to be followed by the health department and the local medical society, and (2) with regard to the technics employed in the service to be rendered. Instruction was given in the use of toxoid, the application of the Schick and Dick tests, the reading of results in the tuberculin test, the relationship of X-ray findings to the diagnosis of tuberculosis, etc. Postgraduate conferences were established; clinicians and public health experts have been imported from distant points at public expense to assist in the training of this new personnel (the family physician) added to the already existing community agencies dealing with preventive medicine. Those physicians who were not wont to attend medical meetings have been sought out in their own offices by a full-time Director of Medical Relations whose sole responsibility is to see that the coöperating physicians are qualified to render the type of service to which the public is entitled. Instruction has been given to undergraduates in medical schools. No opportunity to stimulate the interest of the family physician has been overlooked. The results are significant as evidenced by an increasing tendency for the public to purchase more preventive medicine at the hands of the family medical counsellor. For the immunization of only 18 per cent of the Detroit children known to have been protected against diphtheria during the past 2 years did the health department pay.

Assuming the preparation of the professional public health worker and the participating physician (and the same applies to a participating dentist), we then proceed to the preparation of the public, employing as our agents the generally accepted tools of health education. It is our task to stimulate a response on the part of the individual in order that a health attitude will be established and he will voluntarily seek the service or advice which has been suggested in the interest of his health or the well-being of the members of his household. To stop here, however, we will not have completed the span of health education and administration. There is no need to excite people about the ravages of syphilis or the devastating influence of tuberculosis unless we prepare and establish the facilities through which the individual may receive the benefits which are his due.

We therefore come in our discussion to the question of availability of service. In general, there are two methods which have been pursued in health department procedure. We have clinics for well babies, infants, and school children. There are clinics and dispensaries for the diagnosis and treatment of syphilis and tuberculosis and for the correction of physical defects. There are dental clinics and medical clinics. On the other hand there is being introduced the new concept, al-

ready referred to, of a health center in the office of each practising physician; a place to which the layman may go and obtain adequate preventive service and still maintain that cordial close relationship between the family and its medical counsellor. It is not the purpost of this paper to discuss these two methods of making service available to the public. Suffice it to say that in Detroit, as is well known, there is a distinct leaning to the plan of medical participation and it is on this basis that the present program of tuberculosis case finding has been established. Finally, we come to the end of our span of health education—a point on which there can be no disagreement—that notwithstanding the financial status of the individual, the preventive service or the health promoting activity should be available to all alike.

As has been discussed in detail elsewhere,[2] based upon the concept of public economy, an intensive tuberculosis case finding program was initiated in Detroit during the final weeks of 1936 and the early weeks of 1937. In a community with over 900 deaths annually from tuberculosis (corrected for residence) and with 2,400 hospital beds available to the health department with a resulting obliteration of the usual waiting list, where $2,500,000 is being spent annually for hospital care, it seemed economically illogical to spend such a huge sum for the end results of tuberculosis. Prior to the beginning of this new undertaking not more than 13 per cent of all cases reported by physicians for hospitalization to the health department were in a minimal stage at the time of report. Adding to this the follow-up work of a large health department clinic, there were only 20 per cent minimal. Incidentally, our own Association gives a perfect rating for a city which reports 20 per cent minimal. It is reasonable to believe that by a more intensive case finding program the per cent of minimal in relation to total cases can be materially increased—even as high as 50 per cent. If this could be done the saving to Detroit in hospital bills would be not less than $1,000,000 annually. Why not spend one-fifth of this amount for prevention and save the other $800,000? It was on this basis that the approach was made and the funds were appropriated by the City Council following a well conceived and rather spectacularly executed series of newspaper stories by Paul de Kruif and A. M. Smith, tied in with a series of radio dramas written and executed by Station WWJ, owned by *The Detroit News*. Prior to this, each year the Detroit Department of Health was spending $180,000, or 12 cents per capita, for the prevention of tuberculosis. This money was used largely for the employment of physicians, publice health nurses, and the maintenance of clinic service with a total attendance of 41,102 in 1936, and for such miscellaneous services as usually are found in a modern health department. This sum does not include the cost of the Division of Health Education which in 1936 spent $30,000. The addition, therefore, of $200,000 annually to tuberculosis prevention has more than doubled the appropriation. With this sum there has been purchased the full-time services of 3 highly qualified specialists (a Director of Medical Relations, a Director of Statistical Studies, and an Associate Epidemiologist), 45 new public health nurses, 10 additional statistical clerks, and 2 additional health educators. There has been set aside $80,000 to pay physicians for tuberculin tests and X-ray examinations. A fund has been established for the maintenance annually of 2 post-graduate courses in preventive medicine for family physicians—one in the fall, the other in the spring (each to include 12 hours in preventive medicine).

It is well to emphasize that in the

extension of our case finding facilities in Detroit, we have not destroyed any previously existing service. The clinic of the health department has continued to function with no diminution of service. The old conventional program even including the tuberculin testing of high school children has been continued (there were 9,594 tuberculin tests in 1936). There has been, however, added to the statistical foundation the services of a well qualified medical statistician, ably assisted by 10 statistical clerks, in addition to certain WPA personnel. The preparation of the medical profession has definitely become the responsibility of the Director of Medical Relations, who gives his undivided attention to this service and who has $3,000 for the promotion of postgraduate instruction.* The preparation of the public has been improved by the addition of the public health nurses and the additional health education personnel. The availability of the service has been provided for through the medical participation plan wherein there are 987 family physicians † who are qualified and able to render the required service in their own offices, under a plan directed jointly by the Wayne County Medical Society and the full-time administrative and technical personnel of the department of health. The financial situation has been met by agreement to pay the physician $1 for a tuberculin test in all instances where, in the physician's judgment, the family is unable to meet this expense; $3 to the coöperating roentgenologist † for his flat plate examination and written report; an additional dollar to the family physician for final consultation with the patient, that is, after he has received the report from the roentgenologist. The health department, therefore, may be called upon to pay $1 for a negative tuberculin test and as much as $5 for each positive test.

While there are many so-called "hot spots" in our fight against tuberculosis, we have adhered rigidly to the examination of three important groups: (1) residents of those households in which there has recently occurred a case or death from tuberculosis; (2) those individuals residing in areas of high mortality; and (3) those casuals who filter through the physician's practice, the examination of whom provokes a suspicion of tuberculosis.

The newspaper publicity which consisted only of first page stories began on November 8 and ran for 11 consecutive days. Five minute radio programs were presented on these same days. Beginning on Wednesday evening, November 11, a 30 minute dramatization started and was continued weekly until June 1. The appropriation for new personnel became available on January 1, 1937. The first month was spent in training personnel, and field work actually began February 1.

Local publicity was not started until the nurses were ready to begin work in the field, in order that some check could be made on the value of city-wide publicity alone.

As the nurses advanced in each district, additional preparation of the public was made for them by the use of foreign language and Negro newspapers, visits to the clergy which resulted in announcements from pulpits, group meetings, poster displays, and the careful distribution of literature. The Department of Public Welfare coöperated through the district with special emphasis placed upon the program by Welfare workers. Most other organizations in the district accepted the program as their own.

* During the winter of 1936–1937, 544 physicians attended the postgraduate lectures on tuberculosis.

† As of September 17, 1937, 373 different physicians have reported tuberculin tests and 39 physicians have reported X-ray examinations.

From February 1 to July 1 the public health nurses made a house-to-house canvass in a section of the city with the highest tuberculosis death rate. Approximately one-half of the people residing in this area are Negroes. Prior to July 1, 41,434 individuals * from all sections of the city called at the office of their physician of choice, received a tuberculin test, and the report of the test was forwarded on a suitable card to the Department of Health. Of this number, 10,010, or 24.2 per cent, had a positive tuberculin test. These were individuals at all ages. Of these, 7,403 * have completed the X-ray examination, and from this number have been found 207 new active cases of tuberculosis.† Of these, 70 per cent have either been hospitalized or are in the process of hospitalization.

It is now our intent to report upon the response which has been obtained from white and colored households located in the area of high mortality. The present study is limited to a tabulation of those households with which the public health nurse made her first contact (in this tuberculosis program) during the month of February. In all, 746 white households and 1,294 colored households are included. The first nursing visit was made in February and two subsequent effective visits (visits where a member of the family was actually contacted) were made to ascertain whether the members of the household had responded by going to the office of their physician and requesting a tuberculin test. As the intensive newspaper general publicity was carried in November, it is apparent that these nursing visits occurred about 2 to 3 months later.

Various combinations of time intervals between the visits of the nurse occurred. The most frequent combination was the one where there were from 20 to 30 days between the first and second visits of the nurse; and from 40 to 60 days between the second and third visits of the nurse. Such interval-combination occurred for 52.4 per cent of the white households and for 54.9 per cent of the colored households.

In one sense the households considered do not constitute a sample—in another sense they do. We have included all the records on file for the area concerned and, therefore, we have not selected certain records for analysis. Furthermore, for the area considered, the nurses visited every home. They went up and down the streets and, to all intent and purpose, made a regular census. In another sense, however, the households included do constitute a sample, for they relate only to one section of the city in which dwell people of a certain economic level.

The situation is briefly this: a leading metropolitan newspaper featured tuberculosis in front-page stories, carried for 11 consecutive days; a five minute radio drama (on each of the 11 days) called public attention to the newspaper stories; a 30 minute radio dramatization of the life work of some great pioneer in preventive medicine was presented each Wednesday evening (for 24 weeks) before a studio audience of 300 invited guests and broadcast on Detroit's most popular radio outlet; the health education division of the Health Department through its routine contacts (especially the colored guilds) stressed tuberculosis; the medical profession was alert to its responsibility and participation, likewise the tuber-

* As of September 17, 53,979 tuberculin tests have been reported with 24.9 positive; 10,355 X-ray examinations have been reported.

† Since July 1, 116 X-ray examinations indicating the presence of active tuberculosis have been reported (as of September 17). Upon further examination, some of the individuals concerned may be eliminated as not having active tuberculosis. In other words, the total number of discovered cases will undoubtedly be less than 323.

culosis association; leaders in business, industry, education, and the professions added their support. About 2 months after the publicity began, public health nurses made a house-to-house visit in an area of highest mortality (50 per cent colored) urging every member of the household to go to his own physician and secure a tuberculin test. What happened in this area before and after the nurse's visit and what was the relative value of 2 or 3 visits?

In the 746 white households there were 3,512 individuals of whom 672, or 19.1 per cent, responded. Of these responses, 9, or 1.3 per cent, occurred before the first visit by the public health nurses; 117, or 17.4 per cent, after the first visit and before the second; 375, or 55.7 per cent, after the second visit and before the third; 161, or 24.0 per cent, following the third visit (see Table I).

In the 1,294 Negro households there were 5,844 individuals of whom 2,652, or 45.4 per cent, responded. Of these responses, 118, or 4.4 per cent, occurred before the first visit by the public health nurse; 721, or 27.2 per cent, after the first visit and before the second; 1,464, or 55.2 per cent, after the second visit and before the third; 349, or 13.2 per cent, following the third visit.

Only 0.25 per cent of the whites living in the households responded before the nurse visited the home; 2 per cent of the Negroes responded, *i.e.*, 8 times as many colored people sought a tuberculin test as a result of the general educational program which preceded the nurse's first visit. This may be due to the excellent work of the women who constitute the membership of the Negro guilds and their other local organizations. Among neither the white nor colored people was the response significant.

It is evident that in the group being studied, more than twice as many colored people responded to the total educational activity (including the nursing visits) of the program, than did the white people. Of particular note is the fact that nearly one-half of the colored people approached, responded.

Assuming that the third visit of the public health nurse was not made and,

TABLE I

Tuberculosis Case Finding, Detroit Response to Three Nurse Visits—First Visit Made in February, 1937

	Number of Families	*Number of Individuals*	*Individuals Responding*	*Relation of Response to Visit of Nurse*		
				Relation	*Number*	*Per cent*
White	746	3,512	672	Before 1st Visit	9	1.3
				After 1st Visit	117	17.4
Per cent Responding			19.1	After 2nd Visit	375	55.8
				After 3rd Visit	161	24.0
				Unknown	10	1.5
				Total	672	100.0
Colored	1,294	5,844	2,652	Before 1st Visit	118	4.4
				After 1st Visit	721	27.2
Per cent Responding			45.4	After 2nd Visit	1,464	55.2
				After 3rd Visit	349	13.2
				Unknown	...	
				Total	2,652	100.0

further, assuming that none of the responses recorded as following the third visit would have occurred if such visit had been omitted, of all individuals comprising the white households, the total response would be 14.3 instead of 19.1 per cent. The second assumption is a poor one because a certain number of people recorded as responding after a third visit probably would have done so in the absence of this visit. In the colored households 39.4 per cent (instead of 45.4) would have responded after two visits. For white households the third visits required a total of 746 additional visits, and for colored households, 1,294 additional visits. Perhaps the added work involved, represented by 2,040 nursing visits, is not justified by the additional response obtained when 3 rather than 2 visits are employed.

In summary, there has been added to a conventional program of health education in tuberculosis control (including newspaper, radio, guild organization, talks, routine public health nursing, etc.) a more specific public health nursing educational service, operating under a medical participation plan which makes the service available in 1,000 offices of private physicians notwithstanding the financial status of the individual. The nursing field service seems essential for results. Limiting the number of visits to two seems economically and administratively sound.

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Health Congress at Birmingham

. . . And I would like, just in a few minutes, with a view to stimulating further efforts, to recall some of the achievements of the 60 years that have passed since the days when the Institute was founded. It is a remarkable contrast. In those days the general standardised death rate was 20.3 per thousand; the crude death rate from tuberculosis was 2,866 per million; the infantile death rate, of infants below 1 year, was 149 per thousand births; and the crude death rate of children between 1 and 5 years was 31.2 per thousand living. Let us look at the corresponding figures for 1936. The general standardised death rate was 9.2 per thousand, a fall of one-half; the death rate from tuberculosis, 692 per million, a fall of three-quarters; the infantile mortality rate, 59 per thousand births, two-fifths of the previous figure; the crude death rate of children between 1 and 5 years, 5.5 per thousand living, a little over a sixth. I think it can be said, not, I hope, by any manner of means a boast, that by every known canon the health of the average English man and woman, and especially of the English child, is better today than at any time since the industrial revolution.—Address by the Right Hon. Sir Kingsley Wood, M.P. *J. Roy. San. Inst.*, Aug., 1937.

Education in Nutrition by Private Agencies*

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A THOUSAND and one sources of information on various aspects of human nutrition now seem to be available to harassed health officials, physicians, nurses, social workers, school teachers, and others who desire or need practical data on this important subject. Some of these luminaries, particularly the school teachers, are literally bombarded with dietary propaganda, the acceptance and use of which may or may not be advantageous and wise.

Despite this amazing profusion of real and alleged educational material on diet, most of the persons in the professional groups mentioned need reliable facts about the relation of food to health, since comparatively few of them display any precise or extensive knowledge of this topic. Nutrition is often a neglected subject in medical, nursing, and public health schools.

Some of the available information on dietetics is trustworthy; some of it is on the borderline of reliability; some of it is misleading and prejudiced, but not necessarily dangerous; and some of it is not only unreliable, but perverted, dishonest, and injurious.

In the first category, that of authenticity, is the dietary information emanating from such official or quasi-official agencies as the federal government and most of the state governments, from the League of Nations, and from the leading universities; and that coming from such unofficial and private agencies as medical and public health associations, social welfare organizations, ethical trade associations, honorable business concerns, some of the leading popular magazines, a relatively few of the existing consumer organizations, and many individual scientists of standing.

In the other categories, ranging from mere unreliability through prejudice and extravaganza to downright dishonesty and pernicious faddism, is the information or misinformation on foods disseminated by some of the more mercenary commercial interests, by many of the self-appointed consumers' organizations, and by numerous individual food fakers and charlatans, who have succeeded in influencing a certain deluded fraction of the gullible public.

THE NEED FOR DISCRIMINATION

The seeker after sound and sensible facts on human nutrition must, therefore, learn to discriminate between these various sources of information. Selection of dietary truisms and rejection of those which are lopsided is not always an easy task for the uninitiated. Scientists themselves some-

* Read at a joint session of the Child Hygiene, Food and Nutrition, and Public Health Nursing Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

times make mistakes. Even a Nobel prize winner may display weird ideas on nutrition, ideas that are not strictly in accord with established facts, and there is at least one distinguished physicist who has succumbed to the erroneous and impossible notion that proteins and starches should not be mixed in the diet.

It has been estimated that food manufacturers spend a total of several hundred million dollars a year on educational material. Most of it is far more attractive and much more persuasive than the material issued by the government departments and by voluntary health and welfare associations.

How much of this commercial educational material can and should be used in schools and by health departments? That depends, of course, upon the ethics, ideals, and honesty of the producers and upon the nature of the material. Pamphlets, posters, and projects issued by trade associations and individual concerns regarding such recognized protective foods as pure milk and dairy products, fruits, bread, and meat and fish are, in general, acceptable, provided they give a well rounded concept of nutrition and do not attempt to exaggerate the relative significance of a particular commodity. These associations and firms are, in fact, beginning to realize that the misapplication to their products of such fanciful and unqualified terms as "wonderful," "remarkable," "marvelous," "energy-producing," "health-giving," and the like, can no longer inspire confidence.

These commercial agencies have also learned that there is a definite technic in the preparation of educational material on food; that it must be adapted for the special purpose for which it is intended, such as classroom instruction in a certain grade; that it must be impartial and accurate, as well as alluring; and that the development of the material should be entrusted to an authority in the field, rather than solely to an advertising agency.

THE NEED FOR THE SCIENTIFIC APPROACH

Every commercial producer of educational matter on food should have upon its staff at least one competent scientist who can act as a balance-wheel, particularly against the enthusiastic claims and exuberant half-truths that often erupt from many of the advertising copy writers. These producers of copy are, in general, well intentioned, honest, and coöperative, but they are seldom qualified by training and experience to prepare properly balanced pronouncements on nutrition. They are actuated primarily by the sales motive, which may be expressed in bombastic claims having little if any scientific justification.

The Council on Foods of the American Medical Association has performed a noteworthy service to food manufacturers, to physicians, and the public, by enunciating certain standards for advertising claims on foods, and by accepting various reputable products and the claims made for them. Pamphlets and statements accepted by this Council may, therefore, be used with confidence by health officials and others, although there are, of course, numerous reputable food products and materials that have not been submitted to this unofficial organization.

Among the associations that generally have acceptable material on nutrition, which in the opinion of the writer can be used to advantage by health officials and in schools, are the National Dairy Council, the Milk Industry Foundation, the Evaporated Milk Association, the Certified Milk Producers Association, and the International Association of Ice Cream Manufacturers, all representing the dairy industry; the American Institute of Baking, and the Wheat Flour Insti-

tute, representing the bakers and millers; the National Canners Association; and the Institute of American Meat Packers.

According to lists issued by the U. S. Department of Commerce, there are now in existence about 300 national and interstate trade associations concerned with various edible foods, not to mention another 100 trade associations in the alcoholic beverage field, and 1,000 local associations of food retailers and restaurateurs. Many of these agencies undoubtedly have issued publicity and propaganda, which obviously should be used, if at all, with some discrimination by official groups, especially when the material is concerned with foods or beverages of limited or questionable dietetic value, or with imitations or substitutes for more nourishing foods.

That some of this available material from commercial sources is definitely unsatisfactory is indicated by a recent survey conducted by M. Elizabeth Winkelhake for the American Home Economics Association.[1] In an analysis of approximately 300 advertising booklets used by teachers of home economics in their classrooms, it was reported by specialists who examined this material that 75 per cent of the pamphlets contained questionable statements, that 37 per cent contained false statements, that 43 per cent contained unsubstantiated statements, and 59 per cent contained misleading statements.

Assuming that the personal convictions of the judges of these booklets represent valid scientific opinions, this report would seem to be an indictment of much of the type of advertising that appears in the guise of educational information. It is not, however, an indictment of the nutritional material from private agencies when it conforms to the accepted standards of ethics and scientific accuracy that have been outlined above.

THE NEED FOR MODESTY AND BALANCE

The leading life insurance companies are among the commercial interests that have issued attractive and authentic pamphlets on nutrition, since it is profitable for these concerns to promote good health among their policy holders and the public, and they are not concerned with individual products. Routine use of this material by other agencies is both legitimate and desirable, provided the user has no objections to the display of the name of the company, with its incidental advertising values, although such displays are seldom unduly conspicuous.

Commercial producers of educational material on nutrition should religiously refrain from emblazoning their names and the names of their products in blatant style upon their pamphlets and posters. They are, of course, entitled to proper credit for these contributions, but the display of the name should be modest and inoffensive, and not calculated to give the idea that the sole purpose of the material is for sales and advertising. Concerns who seem merely to have something to sell are properly regarded with suspicion by public health and school authorities, whereas those who apparently are trying to be helpful are always welcome in these fields.

Several years ago the suggestion was made by the author that there be established a commercial health council, which would coördinate the efforts of business in public health, set appropriate technical and scientific standards for the health material issued, and act as a clearing-house, being analogous in its rôle to the National Health Council in the field of our national voluntary health associations.[2] In renewing and urging this recommendation, the adoption of which would unquestionably be a forward step in bringing about a proper correlation between the health educational activities of government

departments and ethical business, it might be suggested that national medical and public health associations would probably be glad to aid in the guidance of such a commercial health council, and they might even profit from the association with it.

NEED FOR COÖPERATION BETWEEN GOVERNMENT AND BUSINESS

In a recent provocative editorial in *The Health Officer*, issued by the U. S. Public Health Service, the question was raised as to whether government and business should coöperate in health education.[3] Citing the experience of the U. S. Bureau of Mines in arranging for educational motion pictures, produced and paid for by private business, this editorial points out the advantages of such coöperation, states that no difficulties have been encountered in more than 15 years' operation of this policy, and asks whether similar arrangements could not be made between public health agencies and commercial interests, especially in the fields of radio and the cinema.

The profit motive which must necessarily actuate business, certainly is not irreconcilable with the cultural and educational motive, which presumably actuates health authorities. The right kind of material put out by the right concerns can and should be used by official agencies. The editorial referred to asserts that the profit motive of life insurance companies, which make money by promoting health, is in harmony with the commonweal. The same may be said of a milk company, a bread company, a fruit company, or the purveyor of any commodity that is acknowledged as a necessary or desirable component of the human diet, or can offer a real and substantial contribution to modern public health.

Where more than one concern in a particular field has made available material of equivalent value, all of it should be used impartially. If only one company has produced worth while material, it deserves recognition for its initiative. If there are objections to any single concern, there certainly should be no objections to the output of an ethical trade association representing an entire industry, such, for example, as the National Dairy Council or the American Institute of Baking.

Every worker in the field of public health, whether in the rôle of health officer, practising physician, social technologist, nurse, or school teacher, should have a practical knowledge of the established principles of human nutrition. Such a working knowledge can be acquired by reading and studying a few of the standard texts by the leading authorities, including Sherman, McCollum, Rose, Lusk, Mendel, Eddy, Bridges, McLester, Sure, Harris, and Fishbein, and other authors whose books on nutrition are favorably reviewed in the *American Journal of Public Health*, and other leading medical, public health, nursing, and scientific magazines.

With such a background, the public health worker will be better equipped to discriminate between the well balanced and the invidious educational material of the private and commercial agencies. If he is still perplexed, he can go to some authoritative source among the governmental and national voluntary health associations for further advice and enlightenment.

Ethical and well balanced material on nutrition from commercial sources should not, moreover, be regarded invariably with scorn or suspicion, but should be utilized for what it is worth. The time may come when the budgets of health departments and schools will permit of the development and distribution of propaganda material that approaches that of the commercial agencies in attractiveness and pedagogical values, but that time does not

yet seem imminent. For the present, therefore, whatever is worth while should be employed in an impartial manner, especially since the public health official and honorable business usually have the common goal, the promotion of public interest in the personal improvement of health.

SUMMARY

Numerous sources of educational material on nutrition are now available to professional workers interested in public health. The problem is not to get material, but to discriminate between the good and the bad.

Nutritional facts issued by reputable trade associations and individual concerns may be utilized to advantage in schools and health departments, when such material is reliable, accurate, well balanced, and free from too blatant sales and advertising motives.

Industrial organizations interested in the promotion of the public health should create a commercial health council to set technical standards for their material, and to coördinate their activities with those of official and voluntary national health agencies.

The profit motive is not irreconcilable with cultural and educational motives, since honorable business is as much concerned with the public welfare as are official bodies.

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Results of Publicity

From a Case Worker's Report to State Bureau of Venereal Disease Control:

"Mrs. T., I found, had been very despondent over this situation (recent discovery that she had syphilis). She felt this disease was an unjust affliction, as she had always led a normal life. She had even contemplated suicide because of the stigma she believed was always a part of the suffering caused by syphilis.

"After reading one of the articles in the *New York Daily News* and learning of the prevalence of the disease and the number of persons innocently infected, she had a different outlook on the situation and decided to take her treatment and cease worrying . . ."

Incidentally, this series of articles won for the *News* the Pulitzer award of honorable mention for "the most distinguished and meritorious public service rendered by any American newspaper during the year."—*Plain Facts*, New Jersey State Department of Health, September, 1937.

Virus Diseases and the Public Health*

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WHY should the virus diseases be singled out for special consideration at this meeting of the Laboratory Section of the American Public Health Association? Without knowledge of what passed through the minds of your program committee I can suggest three cogent reasons:

1. The knowledge of virus diseases is advancing by leaps and bounds and opening up promising new fields of investigation and disease control.
2. Health authorities are not yet taking a part proportional to their responsibility and the increasing opportunities in the investigation and control of virus diseases.
3. The diseases due to viruses are of great and growing importance in the field of preventive medicine.

After a long period of relative stagnation in the study of diseases caused by filterable viruses, during which attention was given mostly to those disease agents which could be seen through the microscope, grown in lifeless media, or tested in the guinea pig, an era of great productivity has been entered. New methods, new technics, new apparatus, and new laboratory animals have been discovered and put to use. New viruses are continually being announced as the causes of diseases of man, animals, plants, and even bacteria. These previously baffling invisible agents are being measured by ultrafiltration or by their behavior in the intense centrifugal field, and are being concentrated in specially devised high-speed centrifuges. Their power to stimulate the production of protective and other antibodies is being studied by quantitative immunological methods and has become the basis of various useful tests. Their degrees of virulence for different animals and for the various tissues of the same animal are being studied and modified. They are being grown in living cells in standard laboratory glassware by simple tissue culture technics, or even in living embryos in egg or uterus, both for producing virus in quantity and for intentionally altering the virulence for certain tissues. For investigational purposes it has been found possible to store virus strains for years without change of character, after drying in the frozen state and sealing in glass tubes. Methods of protective vaccination are being devised and tested for efficacy and safety. Chemical and physical methods are being increasingly applied in bringing to light important evidence of the fundamental nature of viruses. In fact, more is already known about some of the viruses than about many of the bacteria whose morphology and cultural characteristics have long been familiar.

The health agencies, in general, have not given the virus diseases the attention they require. In the United States most state and local health de-

* Read before the Laboratory Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

partments seem to have made their greatest progress through the multiplication of routine service without proportionate attention to the study of the new and special disease problems of their areas. The need for an attack on the virus diseases would be an additional incentive to put a larger number of skilled epidemiologists into the field where disease can be studied in its environment, and to assign more laboratory workers to collaboration with the epidemiologists and to research in laboratory problems of public health importance. I am sure that many of you have regretted the tendency to mechanize epidemiology by increasing the less expensive clerical and statistical handling of routine reports at an administrative office, without arranging for adequate intensive field studies by competent epidemiologists with their base at the laboratory. The virus disease problem at its present stage demands that health authorities take part in the blazing of new trails by field and laboratory research, and that they be prepared carefully to test each new and promising control measure in the virus field before it is sanctioned or used. These functions will usually require special training for selected members of the laboratory staff, some supplementary equipment, and increased provision for experimental animals. It is where the responsibility for health protection rests that methods should be tested, improved, and applied.

The diseases of the virus group include affections of the greatest public health importance. Effective methods for the control of smallpox, rabies, and yellow fever were established long ago by Jenner, Pasteur, and Reed, but they are in need of review and improvement under the searching new technics. False disease entities of prime public health importance, for example the hodgepodges called "influenza" and "the common cold," contain virus diseases which seriously and constantly threaten the public health but which have only begun to emerge from the confusion of unknown and multiple etiology. There is evidence that certain viruses acting as incitants of "influenza," "colds" and other diseases open the door to more serious bacterial infections, which will probably be most easily prevented by identifying and controlling the primary virus factor when our knowledge has advanced far enough.

The number of diseases of man known to be caused by filterable viruses is already impressively large, and there are additional ones probably so caused.[1] Those regarded as definitely in the virus group include smallpox, vaccinia, measles, mumps, epidemic influenza, a variety of common cold, poliomyelitis, psittacosis, herpes simplex, rabies, encephalitis of the St. Louis type, Japanese type B encephalitis, lymphocytic choriomeningitis, lymphogranuloma inguinale, foot-and-mouth disease, Australian X disease, louping ill, Rift Valley fever, yellow fever, dengue, pappataci fever, certain kinds of warts, and *molluscum contagiosum*. The additional diseases strongly suspected of being caused by viruses include German measles, chicken pox, epidemic encephalitis or Economo's disease, and herpes zoster.

Should not the governmental authorities carrying the recognized responsibility for health protection decide which of the virus disease problems in the fields of their jurisdictions are the most important and which are most promising for study, and proceed to carry on adequate investigations and experiments in control? While endowed research institutions and universities have certain advantages in fundamental research in general, it is the public health authorities that can have the clear vision, inspiration, and persistence in investigation, which are born of direct

responsibility for human lives and intimate contact with uncontrolled disease. Their understanding of the urgent needs, in the presence of a wealth of material for observation, puts them in a strategic position for selecting and solving outstanding problems through research, and also for converting the fundamental discoveries of other investigators into useful tools for field study and prevention.

EPIDEMIC INFLUENZA

These general statements need the support of a few examples. Consider for instance epidemic influenza, a specific disease caused by a virus first isolated in England by Smith, Andrewes, and Laidlaw,[2] and also intensively studied in the United States by Francis and his associates.[3] This is the first disease to be raveled out of the group of symptom complexes known as "influenza." The virus has been isolated by transfer from man to ferret in many epidemics in widely separated parts of the world, and it has been transmitted from ferrets to mice. It is being employed diagnostically in standardized tests of human sera in mice for the specific protective antibodies. Moreover, the virus grown in tissue culture has already been used in experimental vaccination with encouraging results.[4]

Hopes have been raised prematurely in popular writings that influenza has been conquered by the new discoveries, notwithstanding the fact that it is not yet known how much of the so-called influenza is the specific disease under study, what is the relationship between epidemic influenza and the periodic influenza pandemics, how widely epidemic influenza is distributed geographically, where the infection exists in the intervals between the characteristic epidemics, and how enduring and effective is the immunity produced by vaccination or the natural disease.

The study of this newly defined specific infection by state health laboratories with the collaboration of epidemiologists, clinicians, and pathologists offers great promise. The most obvious approach would be for the state laboratories to undertake the investigation of epidemic influenza, commencing with the study of standard laboratory strains in inter-epidemic seasons and the isolation of new strains during epidemics. Additional evidence as to the nature of the infection could be obtained by observing, through the protection test in mice, the appearance and increase of protective antibodies in the blood of patients during and after suspected attacks of epidemic influenza. There is evidence that complement-fixation tests may also give valuable information. It is not an unreasonable hope that state laboratories engaged in such work will discover other viruses in the influenza-common cold group and will take an important part in devising control methods for the various specific diseases thus given identity on an etiological basis. It would be only a wise foresight for the people through their health authorities now to make such an investment toward preparedness against another devastating pandemic of influenza. By the same effort they would be taking steps toward understanding and preventing the prostrating epidemic influenza outbreaks of almost every winter and spring. It would be inexcusable if the next pandemic should find us still in the same state of scientific impotence. Fortunately, among the public health agencies in North America, two state departments of health, those of Minnesota and California, and the Connaught Laboratories in Toronto, are already undertaking the study of epidemic influenza.

VACCINIA

Vaccinia is a virus disease of paramount importance to the public health,

because inoculation with its virus is the sole dependence of civilized nations for preventing the return of the old-time deaths and disfigurement from smallpox. Vaccinia has probably been studied more than any other of the viruses producing disease in man. The methods of manufacturing the virus for vaccination purposes and the technic for inserting the virus into the skin have been greatly improved. The present common practice, however, still contains the small risk inherent in the possible inoculation of unknown contaminating bacteria along with the virus and the creation of a vesicle which often becomes an open lesion of the skin. The production of vaccinia virus for vaccination purposes in tissue culture by the methods of Rivers,[5] or in the chick embryo within the egg as first accomplished by Goodpasture and Buddingh,[6] promise the long awaited solution of the problem of completely excluding bacteria from the vaccine. Moreover, by a careful intradermal technic [7] it has been found possible to inoculate a bacteria-free vaccine so as usually to avoid vesicle formation, the infectible open lesion, and the scar.

It is an opportunity and a responsibility of the health authorities to test the more promising of the proposed new methods of vaccination against smallpox for efficacy as well as safety. They will doubtless wish to encourage their general introduction when, and only when, it has been made evident by controlled observations that they have advantages over the older methods and at the same time are sufficiently potent and productive of lasting immunity. The health authorities are the appropriate group to give the verdict as to the desirability of the general use of any of the new procedures so ingeniously developed in the research laboratories. While the efficiency of vaccination must be maintained, it is also important that no opportunity should be missed for making compulsory vaccination laws less unpopular and their evasion less frequent by eliminating all unnecessary risk, discomfort, and scarring.

RABIES

A third virus disease of public health interest is rabies. Essentially a disease of animals, it nevertheless causes some human deaths and necessitates preventive treatment of many persons bitten by rabid animals. Such treatment is expensive and time consuming and carries a degree of risk of failure or treatment paralysis. Rabies prevention cannot be considered successful until the disease and also the need of treatment of persons has been eliminated or greatly reduced. Under certain favorable conditions the disease has been controlled by the muzzling, leashing, quarantine, and destruction of dogs. In the United States these control measures, limited in their application, have not been adequate and the disease appears to be prevalent and increasing in some states. The reported successes in rabies control through the vaccination of dogs in Japan and the availability of one-dose commercial vaccines for dogs has led certain communities to encourage or require the inoculation of dogs in spite of some unfavorable reports as to the efficacy of the method as practised in the United States. The weakness of the situation is that application of the new method has run ahead of investigation. The rabies work in most state health laboratories is almost exclusively diagnostic, and consists chiefly of the microscopic search for Negri bodies in the brain tissue of animals, and the occasional inoculation of laboratory animals. What is urgently needed is the investigation of rabies as a disease of animals, a study of its immunology and epidemiology, and above all exhaustive laboratory tests of any new immunizing

measures or vaccines before they are approved for use or given recognition in the statute books. There is also need for quantitative and comparative investigation of the antirabic vaccines now in use for man and animals. The studies advocated are becoming possible and increasingly practical, for new virus technics for investigating rabies are being made available. Webster [8] has developed a sensitive diagnostic test through the intracerebral inoculation of brain tissue into mice, and also a quantitative mouse protection test for antibodies in the sera of vaccinated persons or animals. Moreover the State Board of Health of Alabama is carrying on a series of field and laboratory studies of rabies and the existing methods of control.

YELLOW FEVER

As a fourth and last example I shall speak of yellow fever, a tropical virus disease which used to invade the United States and produce devastating epidemics, and which is still threatening. In 1927 effective laboratory investigation of this disease was made possible through the discovery of the susceptibility of rhesus monkeys by Stokes, Bauer, and Hudson,[9] and in 1930 the mouse also became available as an experimental animal through the research of Theiler.[10] Through transmission experiments by various investigators it was shown that other mosquitoes than *Aedes aegypti* are potential vectors in Africa and South America. By testing human sera from many parts of the world in mice for the presence of protective antibodies, two large, previously unsuspected endemic areas were revealed in the interiors of Africa and South America. Field studies and the examination of numerous liver specimens taken after death from brief febrile illnesses showed that typical fatal yellow fever was present in the South American endemic area, and of even greater importance was the observation by Soper and his associates [11] that yellow fever was occurring in places in the endemic area of South America in the complete absence of *Aedes aegypti*. They have called the disease, when spread without this mosquito, jungle yellow fever. These discoveries showed that yellow fever must be accepted as a threat of indefinite duration to all infectible parts of the world.

Before yellow fever can be attacked successfully in its endemic areas, more must be known of the epidemiology of jungle yellow fever. Every effort is now being made in the field by the International Health Division of The Rockefeller Foundation coöperating with government health departments to discover the unknown vectors and hosts. In the meanwhile improved methods of vaccination [12] are being used increasingly to protect people under exceptional exposure. To prevent the spread of the infection from the endemic areas the neighboring inland towns and cities will have to be watched and kept as free from *Aedes aegypti* as possible and the rigid aegypti control in important seaports and airports will have to be maintained. Steps are being taken to prevent the carrying of infected persons during the incubation period to infectible countries by airplane or otherwise. Vaccination against yellow fever will be useful in this connection as a supplementary measure. Precautions are also needed against the carrying of infected mosquitoes by airplanes. Specific measures to prevent the spread of yellow fever by air travel are laid down in the International Sanitary Convention for Aerial Navigation signed at The Hague in 1933.[13]

As a last line of defense the cities at or near airports in distant infectible countries, including the warmer parts of the United States, will need to be kept non-infectible by the suppression

of *Aedes aegypti* through efficient control measures like those developed in Brazil. The importance of keeping yellow fever out of the United States has been recognized and the necessary measures have been outlined in a report of the Yellow Fever Committee of the 1937 Conference of State and Territorial Health Officers with the Public Health Service. The measures recommended were: "Isolation of cases, surveillance of air travelers, control of *Aedes aegypti* in communities adjacent to airports of entry, and destruction of mosquitoes on airships." As recently published in the *Public Health Reports*,[14] Certificates of Origin are being required of air passengers embarking in potentially infected regions; planes are being systematically fumigated, with an efficient insecticide; and an officer of the U. S. Public Health Service is now engaged in vaccinating flying personnel against yellow fever with a vaccine devised and furnished by the International Health Division of The Rockefeller Foundation.

As long as yellow fever is kept out of the United States it may not be necessary for the laboratories of the State Boards of Health to enter upon any extensive study which would involve the maintenance of the virus and the immunization of the staff. It could reasonably be expected, however, that they would offer assistance to health officers in establishing the diagnosis in suspected cases. This help would consist of the transfer of virus to susceptible strains of mice by intracerebral inoculation of the patient's blood in the first 3 days of the disease, and also the taking of serum specimens as early as possible and again during convalescence for submission to a laboratory prepared to make protection tests.

These few examples illustrate the great and growing importance of the virus diseases to the public health. Some of the greatest discoveries in preventive medicine have been made in this field. Equal opportunities for advances seem to be looming for the future, but if they are to be realized within a reasonable time, the active participation of the health authorities is needed in the solution of the unsolved problems as well as in the application of accepted procedures.

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Production and Use of Smallpox Vaccine Virus Cultivated in the Chorio-Allantoic Membrane of Chick Embryos*

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THE chorio-allantoic membrane of chick embryos was first used for the propagation of viruses in pure culture by Woodruff and Goodpasture [1] when they demonstrated its susceptibility to the virus of fowl-pox. Following this, Goodpasture, Woodruff, and Buddingh [2, 3] propagated the virus of vaccinia under the same conditions and suggested the use of this method for the production of smallpox vaccine for human vaccination. Goodpasture and Buddingh [4, 5, 6] continued this work and adapted the method for the production of smallpox vaccine on a scale large enough to prove practicable for this purpose. In a large series of comparative experiments they were able to show that vaccine virus propagated by this method yielded a vaccine free from bacterial contaminants which compared favorably in its pathogenicity, potency, keeping qualities, and as far as could be demonstrated, in its immunizing properties, with the virus grown in calves.

The experience gained to the present time with this method and the results obtained from the use of the vaccine from this source in human vaccination will be summarized in this report.

METHOD

A reliable source of fertile hen eggs is indispensable. Eggs from any of the standard poultry breeds can be used although we prefer brown shelled eggs from the larger types. The eggs are placed in a standard poultry incubator at regular intervals so as to have a constant supply of embryos on hand. Fourteen day old embryos are best suited for the cultivation of vaccinia virus. Before inoculation the incubated eggs are candled and the infertile ones and those containing dead embryos are discarded.

A square or triangular window is then made in the egg shell. This is most conveniently done by means of a small electric motor equipped with a flexible driving shaft and sliding chuck into which a small carborundum abrasive disk is fitted. The speed of the motor is regulated by a device operated with a foot treadle. No effort is made to sterilize the eggshells by means of

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disinfectants before cutting the window. By running the motor at a speed just sufficient to allow the disc to cut into the shell, a triangular cut, about 1 inch each way is made through the side of the eggshell. Care must be taken to cut through the eggshell only. The shell membrane must be left intact. The procedure can be easily mastered by a little practice. After the triangular cut has been completed it is covered with a thin layer of paraffin which is kept just at the melting point. With experience 30 or 40 eggs can be prepared at one sitting without injuring the embryos by too prolonged cooling.

The eggs are then placed in a separate laboratory incubator fitted with removable trays constructed of diamond shape mesh which provide adequate support and prevent them from rolling over. This incubator is kept at 37° C.

Exposure of the chorio-allantoic membrane is obtained by cutting through the shell membrane on two sides of the triangular cut with a sterile half spear point dissecting needle. The base of the triangle is left intact and serves as a hinge. Lifting up the shell flap at the apex by means of a sterile forceps or the dissecting needle the chorio-allantoic membrane lying directly beneath is exposed. The inoculum which may be in suspension or in small particles of previously infected material is then placed on the membrane. If small particles of inoculum are used they are picked up with sterile forceps and lightly rubbed over the entire exposed area. The shell flap is then dropped back into place and sealed with paraffin which is kept just above the melting point. The inoculated eggs are returned to the incubator and incubated for 72 hours at 37° C. and kept with the window side up.

At the end of this period the vaccinal lesion is easily recognized as an opaque area of thickened membrane or as a collection of pock-like nodules closely packed together. It is usually 2 to 4 cm. in diameter.

Removal of the virus is accomplished by making a cut with the dental motor entirely around the egg about one-third of the distance from the top. This cut is then covered with melted paraffin. With a sterile dissecting needle the shell membrane along this cut is separated and the entire top of the eggshell lifted off. In this way the vaccinal lesion in the membrane is exposed without contaminating it.

Before removal of the infected area in the membrane its entire surface is mopped with a sterile swab and the swabbing inoculated onto an agar slant. An agar plate, marked off in several sections can also be used for this purpose. Then with sterile scissors and forceps the lesion is cut away and placed in a separate Esmarck dish appropriately labeled for identification with the bacterial control. The lesions are stored in the refrigerator for 3 or 4 days, during which time the bacterial controls are incubated at 37° C.

Separate lesions vary from 0.5 to 2 gm. in weight. Those lesions which prove to be contaminated as shown by growth on the agar slants are discarded. The remainder are pooled in a covered sterile mortar which is surrounded by a freezing mixture of ice and salt. When thoroughly frozen they can be pounded into a fine pulp with a pestle. Grinding is continued until the material is completely thawed. The diluent which may be either 50 per cent glycerol in saline or sterile normal beef serum in proportions of 4 parts of diluent to 1 part of ground pulp by volume is then added. The suspension is stored in sterile containers and subjected to further bacteriological tests. When these prove satisfactory the vaccine is then put up in capillary tubes. The tubed vaccine is tested for potency on the rabbit.

Other methods of inoculating the membrane and of harvesting the vaccine have been suggested, but we feel quite confident that the method here outlined will insure the most constant and largest yield and will obviate the possibility of a low titratable potency due to insufficient takes.

BACTERIOLOGY

When ordinary aseptic precautions are observed at every step of the technic, contamination of the vaccine by bacteria is avoided with comparative ease. By inoculating agar slants with swabbings from the separate lesions, those which have become infected before removal can be eliminated and only sterile material is used for preparing vaccine. Contamination of the virus in the embryo occurs very rarely so that the loss of material from this source is negligible. The prepared vaccine is rigidly controlled for sterility. From each separate batch two agar plates are poured with 0.5 c.c. of the vaccine to test for the presence of aerobic organisms. After 4 days' incubation at 37° C. colony counts are made. The greatest majority of the batches are bacteria free. Counts as high as 5 colonies per c.c. are unusual. Tests for anaerobes are made by inoculating 2 deep meat infusion broth tubes sealed with paraffin with 1 c.c. each of vaccine and incubating for 10 days at 37° C. In all our experience no pathogenic anaerobic organisms have been encountered. An occasional batch of vaccine has been contaminated with anaerobic organisms. These batches, however, were grossly contaminated due to technical errors.

POTENCY AND KEEPING QUALITIES

The potency of the vaccine has always been tested by the method advocated by Leake and Force.[7] Rabbits are inoculated on the shaved and scarified skin with 0.4 c.c. of prepared vaccine in dilutions of 1–100, 1–1,000, 1–3,000, 1–10,000 over separate areas 2.5 x 5 cm. square. The requirements set by this method have been consistently met. Dilutions of 1–1,000 produce a confluent eruption and the 1–3,000 dilution produces an eruption in which the decrease in the lesion is not over 20 per cent of that produced by the 1–1,000 dilution.

When stored at 5° C. and below, either in the bulk or in capillary tubes, the potency of the glycerinated vaccine as tested on the rabbit and by human vaccination undergoes no appreciable diminution over a period of 1 year. It has been found to be viable and to produce good lesions in the lower dilutions in the rabbit after 3 years.

In both its potency and keeping qualities we have found it to compare favorably with calf vaccine.

PATHOGENICITY AND IMMUNIZING PROPERTIES

Comparative studies of the vaccinia developing in experimental animals and man following inoculation with the vaccine cultivated in the chick embryo and calf vaccine have been previously reported by us in detail.[6] In rabbits the lesions from the chorio-allantoic vaccine are slightly milder than from the calf vaccine. In man also a slightly milder reaction is observed. The evolution of the lesion following vaccination by either the single scratch or multiple pressure method is in every way typical in all its stages of vaccinia. General reactions such as fever and malaise and local induration of the subcutaneous tissue as well as glandular involvement is markedly less severe following the use of the chick vaccine as compared with calf vaccine.

Studies of the serological response in experimental animals and man as measured by the inhibitory effect of the immune serum have shown that the chorio-allantoic vaccine produces an

immunity as substantial as that following the use of calf vaccine.

Revaccinations performed with a potent calf vaccine in a small group of children which had been vaccinated with the chorio-allantoic vaccine 2 years previously resulted in immune reactions in each case. We have had no opportunity to test the immunity in man over longer periods of time.

In a series of 1,120 vaccinations performed under field conditions in school children of which 916 were primary vaccinations we obtained 93.6 per cent positive reactions. This compares favorably with the calf vaccine commonly in use.

EFFECT OF CONTINUOUS PROPAGATION IN THE MEMBRANE ON THE VIRUS

During the past 5 years we have propagated a dermal strain of vaccine virus through 220 successive generations in serial transfer without intervening mammalian passage. Constant control and testing of the vaccine for its potency and study of the lesions produced in animals and man indicate that it has not been altered in its essential characteristics. Vaccine prepared from the 220th generation has the same titratable potency for the rabbit as the original calf vaccine with which we started.

The lesions in man are typical of vaccinia in every respect. Careful study of the histology of the lesions produced in the chorio-allantoic membrane as well as the keratitis following inoculation of the rabbit cornea show that the pathogenic properties of the virus as evidenced by the presence of the typical intracellular inclusion bodies and the specificity of the reaction have been maintained. Intervening passage through rabbits and other animals as generally followed in the production of vaccine virus from the calf does not seem to be necessary when the chick embryo is used.

USE OF DILUENTS OTHER THAN 50 PER CENT GLYCEROL IN SALINE

It is well known that glycerinated vaccine virus loses its potency rapidly when submitted to temperatures higher than 5° C. At 37° C. it is found to lose its viability completely in 10 to 12 days. This factor has always presented a great problem during transportation and the use of the vaccine in the field where refrigerator temperatures cannot be maintained. With a bacteria free vaccine it has been possible for us to investigate the use of other diluents, preferably of a colloidal nature, which would protect the virus against the deteriorating effect of relatively high temperatures.[8]

This has heretofore not been possible with calf vaccine since the bacterial contaminants were liable to multiply rapidly when suspensoids other than 50 per cent glycerol were used. Of numerous substances investigated it was found that normal inactivated rabbit or beef serum, preferably the latter for practical reasons, could be used as a substitute for 50 per cent glycerol in dilutions of 4 parts of serum to 1 part the ground pulp. Such vaccine when stored at 37° C. for 6 weeks still produces a positive reaction when inoculated in the undiluted suspension on the scarified rabbit skin.

The vaccine suspended in beef serum and put up in capillary tubes when submitted to the actual field tests during the hot months of July and August by 285 vaccinations in school children produced 92 per cent positive vaccinations as compared with 232 vaccinations performed with glycerinated vaccine from the same source which produced 79.7 per cent positive reactions.

After 4 days' storage at 37° C. the serum-vaccine still produced 94 per cent positive reactions in a small number of school children and after 7 days at this temperature 35 per cent positive reactions were still obtained.

The substitution of sterile normal inactivated beef serum for 50 per cent glycerol as a diluent for vaccine virus propagated in the membrane of chick embryos seems to offer a great improvement in its keeping qualities and resistance to high temperatures. This should be of special value for its use in tropical climates.

DISCUSSION

The chorio-allantoic membrane of chick embryos provides a uniform living medium for the propagation in pure culture of the virus of vaccinia. The intracellular environment which the virus requires for its growth is found chiefly in the epithelial cells of the ectodermal layer. The virus proliferates rapidly so that within 72 hours after inoculation a lesion develops which is large enough to make the production of smallpox vaccine a practicable procedure. Continuous culture in serial transfer from embryo to embryo through numerous generations over a long period of time has not altered the characteristics of the virus. Intervening mammalian passage does not seem to be necessary to keep up its virulence. Careful study has convinced us that the affinity of a dermal strain of virus for epithelial cells is maintained if not enhanced. Since many strains of vaccinia virus have the capacity to infect cells of mesodermal origin, a strain of virus in which the epitheliotropic character is the predominant one should be of practical as well as theoretical importance. The milder character of the lesion in man following vaccination with the chorio-allantoic virus is probably due to this fact. The infection is predominant in the epithelial cells of the skin. The subcutaneous tissues are involved only slightly as compared with the infection following the use of many of the strains derived from the calf. The slightly milder infection has as far as we have been able to determine not affected the immunity response on the part of the vaccinated individual.

It is well known that the chorio-allantoic membrane contains no nervous tissue. The possibility of any enhancement or acquisition of predilection of the virus for nervous tissue is greatly minimized by this circumstance. Although the mechanism of complications involving the nervous system which on rare occasions follow smallpox vaccination is not clearly understood and the virus of vaccinia has not definitely been shown directly to be implicated, this factor is nevertheless worthy of consideration.

Analysis of the serological response as well as revaccinations with potent calf virus indicate that the resulting immunity is as substantial as that induced by virus from the calf.

By this method, a smallpox vaccine can be prepared which is free from bacterial contaminants. No elaborate equipment or complicated technic is required to obtain this result. If the simple precautions previously outlined are followed, contamination is easily avoided and the loss of material from this source is negligible.

Where a constant supply of fertile eggs is available smallpox vaccine can be produced throughout the entire year. Since long periods of storage in glycerol and the addition of bactericidal agents is not required the vaccine can be issued for use immediately after its preparation and sterility control. This should assure a highly active and potent vaccine from which a high percentage of positive reactions may be obtained.

From our experience with the use of normal inactivated beef serum as a diluent for vaccine virus, propagated in the chick embryo membranes, we would recommend its substitution for 50 per cent glycerol. Its protective action for the virus against high temperature is

of a distinct advantage and at least should prevent deterioration of the virus during transportation in the field. For long periods of storage refrigerator temperature is required. It should be of great use in tropical climates.

The multiple pressure or scratch method of vaccination can be used with the chorio-allantoic vaccine with equal effectiveness. Since it is free from bacterial contamination there should be no objection to its use by cutaneous injection.

We believe that culture of vaccinia virus in the chorio-allantoic membrane of chick embryos offers a relatively simple and economically practicable method for the production of a bacteria-free smallpox vaccine. It eliminates many of the objectionable features associated with the time honored calf vaccine and should remove many popular prejudices which have arisen against vaccination on that account. Our experience with the use of chorio-allantoic vaccine for human immunization is relatively limited although our findings thus far have discovered no contraindications to its continued and increased use. Reports on the experience of others who have been using or intend to use this type of vaccine should be very valuable information upon which judgment could be made as to its merits or disadvantages.

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Etiological and Serological Studies in Epidemic Influenza*

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PRIOR to the onset of the influenza epidemic of 1936–1937, much of the evidence which related influenza virus to epidemic influenza of man was inferential. Attempts to determine the incidence of virus infection in the course of an epidemic had not been thoroughly carried out. Furthermore, while it had been demonstrated that in certain instances an increase in antibodies neutralizing influenza virus followed clinical infection,[1,2] the frequency with which this phenomenon was associated with the actual presence of virus in the throat of the patient was not known. Technics, new or improved, were developing but had not been sufficiently applied to permit their evaluation except in the most marked instances. The significance of negative tests could only be surmised. Thus the failure to recover influenza virus from the epidemic of respiratory disease which occurred throughout the United States in the early months of 1936 [3] and the fact that the convalescents did not develop antibodies to influenza virus could only tentatively be taken as evidence that a different disease had been prevalent.

The recent epidemic afforded the opportunity to test the applicability of different procedures to the diagnosis and study of epidemic influenza. The limitations and variations of results could be observed and the data applied to correlative interpretation of the different procedures.

Accordingly, specimens of blood, throat washings, or both, were obtained from 120 patients suffering with respiratory infections during the epidemic period from December, 1936, to March, 1937. The cases were divided among 7 institutions in Metropolitan New York, 1 institution in Tallahassee, Fla., and 1 satisfactory specimen was obtained from San Francisco, Calif. The results of studies in one group of 28 patients have been presented elsewhere.[4] The present report comprises an analysis and summary of the studies of the entire series together with an

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interpretation of the results of the various tests when viewed in the presence of one another.

METHODS

DEMONSTRATION OF VIRUS IN RESPIRATORY TRACT OF PATIENT

Since the recovery of influenza virus from the respiratory tract of a patient constitutes *prima facie* evidence of the nature of the illness, attempts were made in a high percentage of cases to determine, if possible, the presence or absence of influenza virus in the nasopharyngeal washings. The washings were instilled into the nostrils of an anesthetized ferret and subsequently one or both of the following procedures were employed:

1. Suspensions were made of the lung and nasal scrapings of the inoculated ferret and serial transfers made to normal ferrets, after which the virus was established in mice and identified.

2. The inoculated ferret was allowed to recover, and 10 to 14 days after the instillation of the patient's washings, the ferret was bled from the heart. The serum of the recovered ferret was then tested against a known strain of epidemic influenza virus to determine the presence or absence of specific neutralizing antibodies.

In 4 of 6 instances in which attempts were made, the virus was established directly in mice by nasal instillation of washings from the patient's throat, and subsequent serial passages with suspensions of lungs of the inoculated mice.[4, 5] In certain instances filtered throat washings were introduced into tissue culture medium and successive transfers made. With other samples the filtered material was introduced on the chorio-allantoic membrane of the developing egg to attempt direct propagation of virus.[6] The two latter procedures were discontinued after trial since too long a period ensued before virus could be satisfactorily demonstrated without recourse to animal inoculation.

SEROLOGICAL TESTS FOR DEMONSTRATION OF ANTIBODIES

A. *Neutralization or Mouse Protection Test*—Blood was obtained from patients, so far as possible, in the first 3 days of acute illness and again after 3 to 4 weeks. The acute and convalescent sera were tested at the same time for their capacity to protect mice against fatal infection with 1,000 lethal doses of the known P.R. 8 strain[7] of epidemic influenza virus. Undiluted serum and dilutions of serum 1:5, 1:10, 1:20, 1:40, 1:80 and 1:160 in saline were used. Fresh suspensions of infected mouse lung were made in 10 per cent horse serum-saline. To 0.3 c.c. of the serum dilution was added 0.3 c.c. of 0.2 per cent virus suspension. After thorough mixing, the mixtures were incubated at 37° C. for 30 minutes. Three anesthetized Swiss mice were inoculated intranasally with 0.05 c.c. of a serum-virus mixture from a 0.25 c.c. tuberculin syringe. The mice were observed for a period of 10 days, at which time the experiment was concluded. The day of death of each mouse was recorded and the titer of the serum was considered to be the point at which 50 per cent of the mice in the series would be protected.[8] Thus, if all the mice receiving virus and serum in a dilution of 1:40 survived while those receiving virus and serum in a dilution of 1:80 died, the titer would be considered to be 1:60. All titers were recorded in terms of the final dilution of serum. When mice receiving a mixture of virus and the highest dilution of serum (1:320) survived, an arbitrary end-point of 1:640 was given.

At the time of each test a known positive human serum was titrated so as to determine whether gross aberration from the usual had occurred. There was a surprising constancy in the titer of the control serum in different tests, but no attempt was made to record the test sera in terms of

the control as described by the English investigators.[9]

Titrations of the potency of the virus were made with each test. In general the mice receiving the 10^{-6} dilution of virus died while the 10^{-7} dilution was not fatal. Thus the inoculum (0.1 per cent) in the serum tests was 1,000 lethal doses.

One other point was carefully observed. Mice, 4 to 5 weeks of age, from the same breeder were used throughout. This precaution, together with the comparative uniformity of the virus titer and the simultaneous testing of the sera to be compared, resulted in a test capable of repetition within a comparatively close range of constancy.

B. *Complement-fixation Test* — For the purpose of studying antibody titers to influenza virus by means of the complement-fixation test, a procedure similar to that described by Fairbrother and Hoyle [10] was used. The antigen was prepared in a different manner, however. Lungs were removed from 100 to 200 mice infected with the P.R. 8 strain of epidemic influenza virus at or about the time of death. The lungs were ground in physiological salt solution to make a 10 per cent suspension. After centrifugation for 30 minutes at 3,500 revolutions per minute, the supernatant fluid was removed and 10 c.c. amounts were transferred to tightly stoppered vials. The vials were then placed in a thermos at —80° C.[11] When needed for a test, the material was removed from the freezing mixture, thawed, centrifuged lightly, and then diluted to 2 per cent concentration for use. In this range the virus antigen was never anticomplementary. By the procedure described, antigen of uniform strength can be prepared in sufficient quantities to last over a considerable number of tests.

Serum was diluted with physiological salt solution in twofold dilutions up to 1:128.

Guinea pig complement so diluted that 0.1 c.c. contained 2 units was employed.

The hemolytic system comprised 5 per cent suspension of sheep's washed erythrocytes sensitized with rabbit amboceptor. The amboceptor was titrated against 0.1 c.c. amounts of cell suspension; equal volumes of the dilution of amboceptor containing 2 units per 0.1 c.c. and 5 per cent washed cells were mixed.

The reagents were added in the following order:

0.25 c.c. serum
0.15 c.c. complement (3 units)
0.25 c.c. antigen
0.35 c.c. saline

The mixtures were incubated in the water bath at 37° C. for 60 minutes for fixation; 0.5 c.c. of sensitized cells was added and the mixtures were incubated 45 minutes. Final readings were made at that time. Anticomplementary controls of 1 or more dilutions of each serum were always included. The end point was taken as the last tube in which fixation was present. With the test as employed, the end points were rather sharp, fixation infrequently occurring more than 1 tube beyond that in which +++ or ++++ fixation was last observed. All readings were recorded in terms of final dilutions of serum in order to conform with the neutralization test.

Acute and convalescent sera from the same person were included in the same test and a control serum of known titer was always tested for the sake of comparison with other tests. New antigen was always standardized in a similar manner.

THE RECOVERY OF VIRUS

Throat washings (in 2 cases, postmortem lung specimens) from 75 pa-

TABLE I

Summary of Studies in 120 Patients with Respiratory Disease During Epidemic of Influenza

Group No.	Number of Cases	Classification	Average Serum Antibody Titer			
			Neutralization Test		Complement-fixation Test	
			Acute	Convalescent	Acute	Convalescent
I	41	Virus recovered Rise in serum antibodies	22.4	235.0	14.4	142.5
II	1	Virus recovered No rise in serum antibodies	12.5	15.0	64.0	64.0
III	9	Virus recovered No serum tested				
IV	9	No virus recovered Rise in serum antibodies	20.0	292.0	14.0	309.0
V	18	No test for virus Rise in serum antibodies	14.8	340.0	15	405.3
VI	11	No virus recovered No rise in serum antibodies	50.4	43.2	40.7	24.2
VII	2	No test for virus No rise in serum antibodies	80 15	140 15	32 32	32 16
VIII	13	No test or negative test for virus Acute serum obtained late	185.7	231.9	416	357
IX	8	Convalescent serum only		123	...	344
X	5	Incomplete or unclassified				

Total of 117 listed is due to the fact that the throat washings of 3 patients were pooled with others.

tients were tested by ferret inoculation for the presence or absence of influenza virus. Of these, 52 samples were found to contain the virus of epidemic influenza even though many of the specimens had been stored for a considerable period before testing. From 23 of the patients strains of virus were established in mice; 4 by direct transmission, 1 after primary isolation in tissue culture medium, the remainder after intermediate ferret passage. In general, little difficulty was encountered in transferring the disease to mice, much less than had been the case with some of the strains from other epidemics.

The virus recovered was in each instance human influenza virus; the virus was neutralized by serum of animals immune to the P.R. 8 strain but not by swine influenza serum. Thus, it is shown that the primary etiological agent of the epidemic of respiratory disease was the virus of epidemic influenza.

SEROLOGICAL STUDIES

Samples of serum were obtained from 106 patients. From 96 of these patients, serum was secured during the acute period of illness and again in the third week of convalescence. Examination of throat washings for the detection of virus and titrations of antibodies in the patient's acute and convalescent sera were done in 65 cases.

TABLE II

Serological Reactions in Patients with Respiratory Disease

Case No.	Lab. No.	Day of Disease	WBC in 1,000	Past History	Titer of Neutralizing Antibodies: Acute Serum	Titer of Neutralizing Antibodies: Convalescent Serum	Titer of Complement-fixing Antibodies: Acute Serum	Titer of Complement-fixing Antibodies: Convalescent Serum	Diagnosis and Remarks
				Group I—Virus in Throat Washings—Positive Serological Reactions					
1	BL-1	2	5.8		6	280	16	256	Epidemic influenza
5	BL-5	1	9.0	1926	40	70	8	16	"
6	BRK-1	2	10.0	Neg.	0	140	0	256	"
8	BRK-3	2	5.5	Neg.	6	200	0	128	"
11	TF	1	7.3	1923	15	400	..	...	"
12	BRK-7	3	5.4		15	640	8	256	"
26	BRK-28	1	5.2	1918	15	640	8	512	"
28	BRK-34	2	...	1936 ?	30	200	64	128	"
33	BRK-39	2	...	?	40	120	0	8	"
34	BRK-40	2	...	1918, 1936	4	100	8	16	"
38	NYH-3	3	6.9	Neg.	0	15	8	64	"
39	NYH-4	2	5.0	Neg.	6	100	16	64	"
40	NYH-5	3	5.6	Neg.	6	225	0	128	"
45	NYH-10	2	8.6	Pneumonia, 1933	200	640	8	64	"
47	NYH-12	3	7.4	Neg.	50	640	16	128	"
48	NYH-13	1	3.4	1918	50	320	0	64	"
49	NYH-14	2	4.8	Neg.	4	218	0	128	"
50	NYH-15	3	8.5	Neg.	30	100	0	64	"
51	NYH-16	2	6.7	1931, 1933	15	640	0	128	"
54	NYH-19	2	6.1	Neg.	0	35	8	512	"
55	NYH-20	3	6.2	Neg.	6	50	16	64	"
56	NYH-21	2	5.8	Neg.	0	35	32	64	"
57	NYH-22	2	7.8	Neg.	10	60	8	128	"
58	NYH-23	4	3.5	1928	30	206	32	128	"
59	NYH-24	3	3.3	Neg.	4	103	8	128	"
61	NYH-26	3	8.0	1918	15	100	0	16	"
62	NYH-27	3	3.8	1918	6	240	8	128	"
63	NYH-28	3	5.6	Neg.	30	240	8	128	"
65	MET-2	1		1918	15	640	16	512	"
66	MET-3	1		1918, 1935	16	60	0	32	"
67	RIH-1	3	4.2		0	35	32	64	"
72	RIH-6	2	5.5	Neg.	6	140	8	256	"
74	HH-1	4	8.3	1918, 1927	120	200	16	32	"
75	HH-2	4	5.5	Yes	0	25	0	256	"
78	RI-10	3	6.5	1929	12.5	100	8	32	"
79	LTC	1	8.3	Neg.	20	200	8	32	"
80	WC	2			0	15	8	64	"
81	ERR	0		1918, 1933	30	70	8	16	"
88	FLA-7	3	4.0		8	100	64	256	"
93	FLA-12	4	5.4		35	640	0	512	"
99	FLA-18	4?	6.0		30	640	512	1,024	History inaccurate
Average		2.3*	5.9		22.4*	234.7*	14.4*	142.5*	
* (Exclusive of No. 99)									
				Group IV—No Virus in Throat Washings—Positive Serological Reactions					
9	BRK-4	3	7.2		30	640	16	256	Epidemic influenza
27	BRK-32	2	7.8	Neg.	8	640	8	512	"
30	BRK-36	1	9.1	1918, 1933	12.5	280	32	512	"
36	NYH-1	3	6.8	1918	6	50	0	32	"
37	NYH-2	2	4.1	Neg.	4	160	32	128	"
42	NYH-7	4	4.0	1918	100	280	16	256	"
44	NYH-9	2	4.5	Neg.	15	120	8	32	"
82	FLA-1	4			6	320	8	1,024	"
105	FLA-24	3			8	640	8	32	"
Average		2.7			20	292	14	309	

(Table continued on next page)

TABLE II—(Continued)

Serological Reactions in Patients with Respiratory Disease

Case No.	Lab. No.	Day of Disease	WBC in 1,000	Past History	Titer of Neutralizing Antibodies		Titer of Complement-fixing Antibodies		Diagnosis and Remarks
					Acute Serum	Convalescent Serum	Acute Serum	Convalescent Serum	
		Group V—No Throat Washings Tested—Positive Serological Reactions							
15	BRK-13	2	8.0		17.5	640	0	128	Epidemic influenza
16	BRK-14	2	11.2		15	640	..	512	"
18	BRK-16	3	10.4	1918	6	640	0	128	"
19	BRK-17	3		1918	6	60	8	64	"
20	BRK-18	3	10.2	1918	0	30	0	256	"
21	BRK-18A	4	5.1	?	17	80	32	128	"
24	BRK-20	4	5.4	1918	60	640	8	128	"
25	BRK-21	2	7.6	?	6	640	0	1,024	"
29	BRK-35	2	...	?	0	640	0	1,024	"
41	NYH-6	3	...	1918	6	225	16	256	"
46	NYH-11	4	...	1918	30	240	16	128	"
73	RIH-7	2	7.3	?	6	640	16	1,024	Type III Pneumococcus bronchitis
85	FLA-4	4	...		0	35	32	128	Epidemic influenza
87	FLA-6	5	11.0		4	60	32	512	"
94	FLA-13	4	6.5		70	320	32	256	"
95	FLA-14	4	6 0		15	80	8	128	"
100	FLA-19	4			0	640	32	1,024	"
111	RIH-10	1			6	70	8	64	"
Average		3.1			14.8	340	15	405.3	
		Group VI—No Virus in Throat Washings—Negative Serological Reactions							
32	BRK-38	3		Neg.	8	13	0	8	Not influenza
43	NYH-8	2	12.6	Neg.	30	30	8	8	Strep. throat
52	NYH-17	3	25.0	Neg.	60	50	32	32	"
53	NYH-18	2	12.0	Neg.	100	100	32	32	"
60	NYH-25	5	4.8	Neg.	0	0	0	0	Afebrile sinusitis
76	RIH-8	6	13.1	Multiple	15	17	32	32	Bronchitis
77	RIH-9	3	10.3	1918, 1931, 1936	107	35	64	64	Mild coryza
108	LV-2	5			25	17.5	32	32	Not influenza
112	RIH-11	2	7.5	1934	60	60	16	16	Proven case 1934
70	RIH-4	3	21.9	1918, 1936	120	70	256	64	Strep. tracheitis
89	FLA-8	9	8.5		30	60	8	8	Not influenza
Average		4			50.4	43.2	40.7	24.2	
		Group VII—No Throat Washings Tested—Negative Serological Reactions							
31	BRK-37	1	13.4	?	80	140	32	32	Not influenza
102	FLA-21	5			15	15	32	16	
		Group VIII—Patients Seen Late in Disease—Positive Serological Reactions							
68	RIH-2	9	17.0	Neg.	60	60	512	128	Atypical pneumococcus pneumonia
69	RIH-3	9	10.9	Neg.	200	70	1,024	512	Acute bronchitis
71	RIH-5	7	9.7; 18.0	?	125	125	32	32	Atypical Type V pneumonia
83	FLA-2	6	4.7		30	200	128	256	
84	FLA-3	6	9.0		60	120	128	256	
86	FLA-5	9	6.0		280	240	1,024	512	
90	FLA-9	9	5.6		100	400	128	256	
92	FLA-11	6			0	240	128	512	
96	FLA-15	6	8.0		103	240	128	256	
97	FLA-16	5+			640	640	512	512	Relapse
98	FLA-17	4+	6.2		120	240	128	128	"
101	FLA-20	11			640	240	1,024	256	
104	FLA-23	8			60	200	512	1,024	
Average		8			185.7	231.9	416	357	

(Table continued on next page)

TABLE II—(Continued)

Serological Reactions in Patients with Respiratory Disease

Case No.	Lab. No	Day of Disease	WBC in 1,000	Past History	Titer of Neutralizing Antibodies: Acute Serum	Titer of Neutralizing Antibodies: Convalescent Serum	Titer of Complement-fixing Antibodies: Acute Serum	Titer of Complement-fixing Antibodies: Convalescent Serum	Diagnosis and Remarks	Titer 3 Months Later: Neutralization Test	Titer 3 Months Later: Complement-fixation Test
Group IX—Only Convalescent Serum Obtained—Positive Serological Reactions											
91	FLA-10	8	4.8					512			
103	FLA-22	5						1,024			
115	BRK-26	35	6.2			120		128		120	16
116	BRK-23	30	6.7			240		256		240	128
117	BRK-25	35	16.7			35		256		35	64
118	BRK-24	40	8.4			240		256		240	64
119	BRK-22	33	11.2			35		64		35	0
120	BRK-33	18	9.6			70		256		50	128
Average						123		344		120	66.6

In the great majority of instances the first sample of serum was taken before the 5th day after onset, but in 13 the first serum was not obtained until the 6th day or later. So far as possible, with each specimen of serum parallel titrations of antibody content were made by means of the protection test in mice and by the complement-fixation test. Since a large percentage of the cases studied serologically were also investigated for the presence of influenza virus in the throat, the significance of the various results was more readily established. The results are summarized in Table I and presented in detail in Table II.

RESULTS OF SEROLOGICAL TESTS IN RELATION TO THE RECOVERY OF VIRUS

Titrations were made with the acute and convalescent sera of 42 patients in whose throat washings influenza virus was found. In 41 instances (Group I) a rise in the antibody content of the convalescent serum over that of the acute serum was observed. The average titer of neutralizing antibodies in the acute sera was 22.4 and in the convalescent sera, 235. The average titer of complement-fixing antibodies was 14.4 for the acute sera, 142.5 for the convalescent. With both tests the average increase in titer was approximately tenfold. In only one case, a patient who experienced characteristic symptoms but had no fever (Group II), was virus recovered without a corresponding rise in antibodies. Since the first group of 41 patients comprises only individuals in whom the virus was clearly shown to be present, tests made with the serum of these subjects represent the serological reactions of established cases of epidemic influenza. The uniform rise in antibodies in convalescence and the individual variations observed afford a satisfactory basis for the interpretation of the results obtained with material from other patients.

From throat washings of 9 patients (Group III), virus was recovered but no serum was obtained for serological studies.

In 9 cases (Group IV), virus was not recovered from the throat wash-

ings but the serological tests yielded results which conformed with those observed in patients whose throat washings contained influenza virus. The average titer of neutralizing antibodies in the acute sera was 20, in the convalescent sera 292. With the complement-fixation test, the average acute titer was 14.2, the average convalescent titer, 309.3. In each instance a sharp rise in titer occurred. Seven of the specimens of throat washings from these 9 patients had been kept in storage for 6 weeks to 4 months while the other 2 arrived by mail and contained heavy bacterial growth. Despite the fact that no virus was demonstrated, the striking increase which occurred in antibody titer appears to warrant the diagnosis of epidemic influenza in these cases.

From a series of 18 patients (Group V), throat washings were not available for study. Samples of acute and convalescent serum from each patient were examined serologically, however. The average titers by neutralization test for the acute and convalescent sera were 14.8 and 340, respectively; by the complement-fixation test, 15 and 405.3, respectively. In this series again the rise in antibodies is of sufficient degree to permit the assumption that the responses were the result of infection with the virus of epidemic influenza.

In the first group of patients presented above a diagnosis of epidemic influenza was based primarily upon a demonstration of the influenza virus in the patients' throats. When the antibody titers of the same patients were determined, a distinct sequence of events was noted. Following recovery from the virus infection the antibody titer of the convalescent serum had increased on the average to 10 times the height observed in the serum obtained during the acute illness. Applying the standards afforded by those studies, it was possible to interpret the results of serological tests made with the serum of certain patients whose throat washings failed to yield virus or from whom no throat washings were available. Because of the similarity of the serological findings in both groups, it was concluded that the latter individuals had also suffered from epidemic influenza.

In contrast to the preceding groups is a series of 11 patients (Group VI) from whose throat washings virus was not recovered and in whom, moreover, the serological tests gave quite different results. The average acute and convalescent titers as determined by the neutralization test were 50 and 43, respectively, and with complement-fixation test, 40 and 24, respectively. In only 1 patient (No. 32) was an increase noted by both tests and this was well within the limit of error. In the majority of the others the acute and convalescent titers were almost identical. Of this group, 4 suffered from hemolytic streptococcus infections. One of these had been ill 3 weeks previously and possessed a high titer of antibodies when observed in the present illness, suggesting that the earlier illness had been influenza. Three of the patients suffered from rather prolonged respiratory affections with low grade fever. One of them (No. 112) had a proven case of epidemic influenza in 1934; 2 additional attacks of mild respiratory disease had occurred in the interval. The antibody titer of the serum showed a marked rise after the first illness but when tested before and after the other episodes remained constant. Nor was it influenced by the present illness.

It appears then that these patients from whom no virus was recovered did not respond serologically in a manner similar to that of established cases of epidemic influenza. The fact that the comparatively low titers of the acute

sera remained low and, in most instances, identical in convalescence is significant. The completely negative evidence appears to justify the conclusion that the causative agent of illness in these patients was not the virus of epidemic influenza. Quite striking is the fact that 4 of them were hemolytic streptococcus infections which occurred in the midst of the influenza epidemic but with no evidence that they were etiologically related in any way to the epidemic. The entire group represents cases of respiratory infection occurring at the same time as an influenza epidemic which etiological and serological studies combine to identify as of a different nature. Similar conclusions were drawn regarding 2 patients (Group VII) in whom only serological tests were done. No significant differences were observed between acute and convalescent antibody titers.

In contrast to the patients observed early in the disease, whose sera showed a marked rise in antibodies following recovery, is another series of 13 patients (Group VIII) who were first seen 6 to 11 days after onset. From 3 of them throat washings were tested, but no virus could be demonstrated. The outstanding difference between the results obtained in these cases and those previously mentioned lay in the fact that the antibody titer of the first serum sample was in general as high as that of the usual convalescent serum. Thus, by neutralization test the average acute and convalescent titers were 186 and 232, respectively, and by complement-fixation test, 416 and 357, respectively. The high titers observed in the supposedly "acute stage" serum indicate that these subjects were in fact serologically convalescent from epidemic influenza. It is impossible to state whether the illness from which the patient was suffering at the time of observation was a prolongation of the attack of influenza although this is suggested in 3 cases which were diagnosed tentatively to be cases of atypical pneumonia. Two other patients were suffering from what were termed relapses. Among the remainder, the first serum specimens were obviously obtained after recovery had begun and they should probably, therefore, be considered to represent early convalescence. This is further emphasized by the demonstration that the second specimen of serum obtained 3 to 4 weeks later from the same cases showed no prominent increase in complement-fixation titer, which in 7 of the 13 remained unchanged at a high level or had decreased. The titer of neutralizing antibodies increased to some extent in 7 instances, and the results suggest that in general a high titer of antibodies is detected earlier with complement-fixation than with the neutralization test.

Finally 12 cases are included concerning which the data are incomplete. Two of the specimens were of lung obtained at autopsy from cardiac patients who suddenly developed fever and exaggerated pulmonary symptoms during the epidemic and died. From one of the lung specimens, after repeated ferret passage, virus was recovered. From 2 patients the only specimen was serum obtained during the acute illness. One patient (No. 35) is unclassified although considered negative. From the remaining 8 patients (Group IX) only convalescent serum was obtained. The average titer of neutralizing antibodies in these sera was 123, of complement-fixing antibodies, 344. While it is impossible to be conclusive, the antibody titers of the sera were sufficiently high, but for 1 doubtful case, to permit their inclusion with the specific convalescent sera.

EVALUATION OF SEROLOGICAL TESTS

While on the average the antibody titer of the convalescent serum was

10 to 20 times greater than that of serum taken during the acute illness considerable variation occurred in the antibody responses of different individuals to infection. The tests in a group of 62 cases from which the acute specimens of serum were definitely obtained in the first 4 days of the disease were analyzed with the assistance of Dr. Hugo Muench to determine what correlations could be drawn between the original and convalescent titers as measured by the neutralization test in mice and by complement-fixation technic. The distribution of the results is shown in Figures I and II. The extent to which the titer will increase following infection is not predictable by either method. Of the 62 acute sera, however, only 7 possessed neutralizing antibodies in a concentration greater than 1:40. The titers of these latter sera were 50, 50, 50, 80, 100, 120, and 200, respectively. In fact, only 20 of the 62 acute sera possessed neutralizing titers higher than 1:15. On the other hand, among the convalescent sera all but 8 had titers higher than 1:40 (15, 16, 17.5, 20, 30, 35, 35, 35) and 7 of these 8 results were in patients whose acute serum possessed no neutralizing capacity. The convalescent titer in 35 instances was greater than 1:128 and in 15 the limit of titer, 1:640, was reached.

FIGURE I

Titer of neutralizing antibodies in acute and convalescent sera of 62 patients
(Each dot represents one individual)

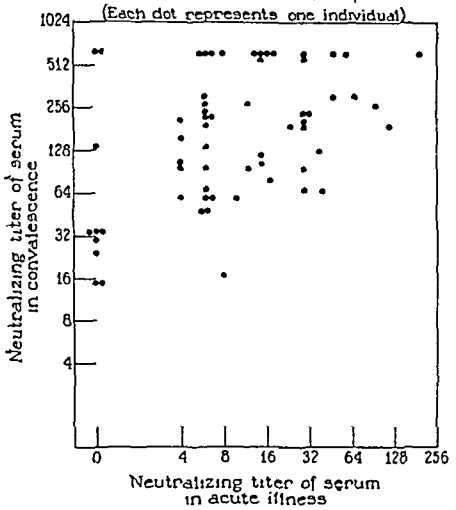
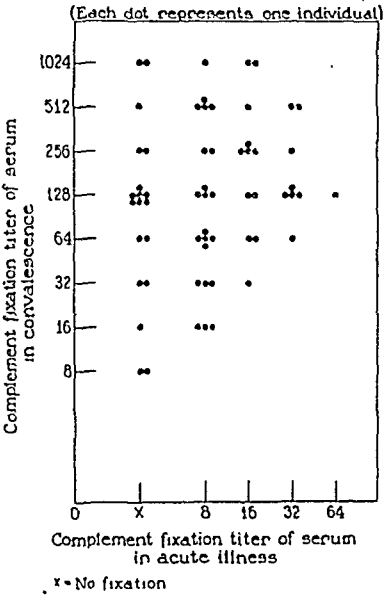


FIGURE II

Titer of complement-fixing antibodies in acute and convalescent sera of 62 patients
(Each dot represents one individual)



Similar results were obtained by means of the complement-fixation test. The titers of 19 of the 62 acute sera were negative (less than 1:8), 22 possessed titers of 1:8, while only 1 reached a titer of 1:64. In convalescence 2 of the sera titered 1:8, 4 titered 1:16, 6 titered 1:32. The remaining 50 sera all possessed complement-fixing properties in the presence of influenza virus to a titer of 1:64 or greater, 5 of them reaching titers of 1:1,024.

It appears from the results of the parallel tests that a critical antibody level is reached somewhere in the range of 30–40. Over 85 per cent of the acute sera fall below this level, while of the convalescent sera approximately the same percentage has titers higher than 1:30. With either test the convalescent sera of low titer were from

patients whose antibody titer was at the lower limits of mensuration during the acute illness.

The mean proportionate increase in antibody titer measured by the two serological tests has a positive statistical correlation, emphasizing the tendency to parallelism of the results. The individual variation is pronounced, however, and a marked rise in antibodies by the protection test may occur with only a mild or moderate rise in complement-fixing antibodies. There is, nevertheless, a tendency for the sera of the individuals having high original titers to have a smaller logarithmic increment of antibody development in convalescence.

In certain instances the classification of the serum as positive might be questioned if the results of only one test had been relied upon, but with the additional data at hand it has been possible more clearly to evaluate the variations in the individual cases than it would have been had only one test been used. The results demonstrate as with all other immune processes that while in general a sharp response to the immunogenic agent occurs, certain individuals respond meagerly. The extent of the response appears to be related more to the peculiarity of the individual than to any measurable factor such as the severity of disease or a preëxisting antibody level.

SEROLOGICAL STUDIES IN NORMAL CONTACTS

Two cases (Nos. 79 and 81) have been recorded [4] in which the patients exhibited such minimal evidence of disease as to constitute instances of subclinical infection. Furthermore, it was of interest to determine whether individuals who escaped clinical infection possessed a characteristic level of serum antibodies. In order to secure information bearing upon these points, serum was obtained in one institution from a group of persons who had multiple exposures to the disease, frequently

FIGURE III

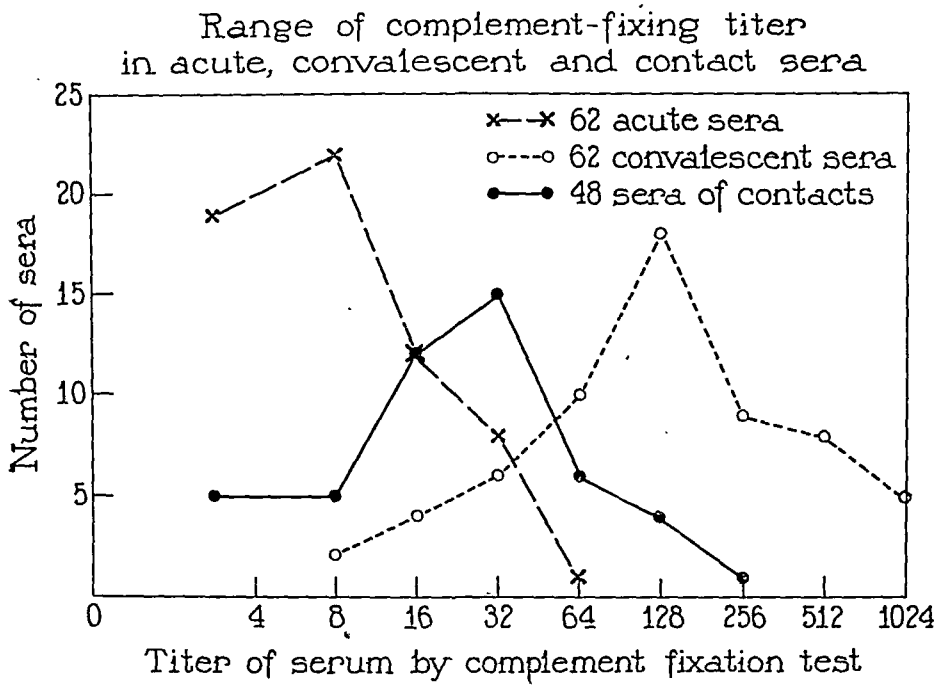
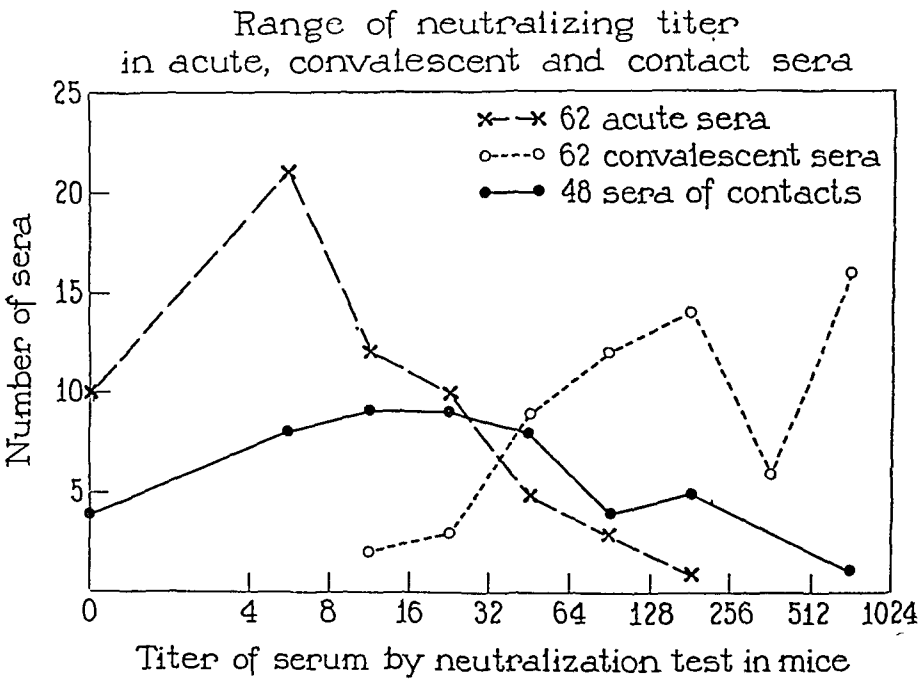


FIGURE IV



by close contact in the same wards, but who developed no clinical evidence of infection. At the time the first specimens of serum were taken from the contacts (January 21, 1937), the epidemic had been in progress for over a month, so that considerable opportunity for infection had occurred. In 5 of the 53 contacts (Nos. 6, 9, 30, 40, and 43), however, histories of illness during the current epidemic period required that these 5 patients be considered probable cases of influenza.

All sera were tested for neutralizing and complement-fixing antibodies to influenza virus. The average titers of the 48 sera were 58.5 by neutralization test and 38.5 by complement-fixation test. The results of the titrations were then compared with the acute and convalescent titers of sera from influenza patients. The comparison is presented graphically in Figures III and IV. The titers of acute and convalescent sera from the same 62 patients previously discussed, together with the serum titers of 48 contacts, are shown in the form of distribution curves.

With complement-fixation 41, or 66 per cent, of the acute sera have titers of 1:8 or less, while of the convalescent sera 40, or 64.4 per cent, have titers of 1:128 or more. The sera from the 48 contact cases, however, occupy an intermediate position since the titers of 33, or 69 per cent, of them ranged from 1:16 to 1:64. Only 10, or 21 per cent, of the contact sera fall in the zone of antibody titer in which two-thirds of the acute sera congregate, while 5, or 10.4 per cent, reach the height to which two-thirds of the convalescent sera attain. Thus the titers of the great majority of the contact sera lie in the range of the upper limit of the acute titers and the lower limits of the convalescent titers. The chance of probability that the titers of the sera from contacts belong in either the acute or conva-

lescent group is of the order of 0.000.000.1, which indicates that these results comprise a statistically distinct group rather than a mixed group of individuals in the acute and convalescent periods. In the latter case the distribution should be represented by a diphasic curve with its dip in the zone where the highest point actually occurred.

With the neutralization test the same tendency prevails although the differential is not so strikingly apparent. In fact, the distribution curve has more of a plateau which does, however, tend to occupy a mid-position. An analysis of the neutralizing antibody titers similar to that made of the complement-fixation results reveals that 31, or 50 per cent, of the acute sera and 12, or 25 per cent, of the contact sera have titers of 1:8 or less. In the upper range 36, or 58 per cent, of the convalescent and 6, or 12.5 per cent, of the contact sera have titers greater than 128. In the intermediate zone of titers between 8 and 128 fall 30, or 62.5 per cent, of the contact sera, an equal number (30, or 48.3 per cent) of the acute sera, and 26, or 42 per cent, of the convalescent sera. In any case the greatest frequency in the titers of the contact sera lies in the range beyond the greatest frequency of the acute titers and below that of the convalescent sera. The chance that the titers of the contact group represent individuals similar to those in the acute group is 0.003, and that they belong in the convalescent group is .000.000.01. These tests confirm the impression gained from the graphic representations.

The intrepretation of these results is not entirely obvious. While statistically the contact group represents a significant difference from the other two, it is apparent that since the titers lie in the intermediate position between acute and convalescent sera three explanations may be offered. The first is that these subjects represent individuals who have had higher antibody levels and are gradually reverting to a lower level. The second possible explanation is that the majority had suffered from sub-clinical infections resulting in comparatively low antibody titers. The third is that the majority of these patients had stabilized at this level and had actually escaped recent infection. The average titer of neutralizing antibodies in the group was 58.5 and of complement-fixing antibodies 38.5, not strikingly different from the patients of Group VI in whom no evidence of virus infection was obtained, but higher than the average acute serum. That the titers in the upper extremes, which comprise 10 cases (Nos. 2, 4, 12, 17, 20, 26, 31, 33, 34, 37), may represent recent infections cannot be denied. One of them (No. 17) most probably was, and in a similar manner those of the lowest titers might well under proper conditions become typical cases.

In an attempt to gain information for interpreting these points, serum from 39 of the contacts after an interval of 3 months was again obtained and tested, and histories were carefully analyzed. The results are shown in Table III. One patient (No. 27) had suffered from influenza beginning 4 days after the first bleeding, with a distinct rise in the antibody content of the second bleeding. In 3 other instances (Nos. 5, 21, 53) an increase in antibodies by both tests was noted. In 1 instance (No. 17) which had the highest titer of the group previously, a definite decline was observed by both procedures.

In 2 instances (Nos. 4 and 33) it is suggested that the patients were actually in the process of building up their antibodies at the time of the first bleeding since the complement-fixation value was high and a sharp

TABLE III

Serological Reactions in Normal Human Contacts

Contact No.	*Date of Bleeding*	*Titer of Neutralizing Antibodies*	*Titer of Complement-Fixing Antibodies*	*History Prior to First Bleeding*	*History Subsequent to First Bleeding*	*Comment*
1	1-21-37	4	8	Grippe Nov., 1936	Negative	
	4-22-37	6	8	Influenza 1918, 1933		
2	1-21-37	200	128	Negative	Negative	Probably sub-clinical infection
	4-22-37	200	64			
3	1-21-37	8	32	Grippe Nov., 1936 Influenza 1918, 1935		
4	1-21-37	30	128	Negative	Negative	"
	4-22-37	120	128			
5	1-21-37	6	8	Influenza 1917; none since	Negative	"
	4-22-37	30	32			
6	1-21-37	240	64	Severe cold Dec., 1936	Negative	Considered to be clinical case; not contact
	4-22-37	160	64			
7	1-21-37	30	32	Negative	Upper resp. inf. Mar. 1937 Sore throat, temp. 104° 4 ds.	
	5- 7-37	100	16			
8	1-21-37	60	64	Influenza 1931	Negative	
	5- 7-37	70	16			
9	1-21-37	50	64	Influenza few weeks before; no fever	Negative	Considered to be clinical case; not contact
	5- 7-37	640	32			
10	1-21-37	35	16	Influenza 1927	Negative	No evidence of disease
	4-22-37	50	16			
11	1-21-37	50	16	Negative	Negative	"
	5- 7-37	70	16			
12	1-21-37	240	64	Negative	Negative to 3-1-37	Sub-clinical infection?
13	1-21-37	60	32	Negative	Negative	
	4-22-37	100	32			
14	1-21-37	6	8	Negative	Negative	
	4-22-37	4	0			
15	1-21-37	17.5	8	Negative	Negative	
	4-22-37	30	8			
16	1-21-37	25	64	Negative	Negative	
	4-22-37	30	32			
17	1-21-37	640	256	Influenza 1918	Negative	Certainly sub-clinical infection
	4-22-37	120	64			
18	1-21-37	8	0	Influenza 1918	Apr. 1, 1937, sore throat, cough, no fever, 5 days	No evidence of influenza
	4-22-37	6	0			
19	1-21-37	30	16	Influenza 1918	Negative	
	4-22-37	30	0			
20	1-21-37	100	32	Influenza 1933	Negative	
	4-22-37	50	32			
21	1-21-37	27	16	Negative	Negative	Questionable antibody rise suggests infection
	4-22-37	60	32			
22	1-21-37	6	16	Negative	Negative	
	4-22-37	4	8			
23	1-21-37	8	32	Negative	Negative	
	4-22-37	15	32			
24	1-21-37	8	16	Negative	Negative	
25	1-21-37	0	32	Influenza 1919	Negative	
	4-22-37	0	16			
26	1-21-37	240	128	Negative	Negative	High antibody suggests sub-clinical infection
	4-22-37	200	64			
27	1-21-37	0	0	Negative	Influenza beginning 1-25-37	Typical case during course of observation
	4-22-37	30	32			
28	1-21-37	80	64	Negative	Negative	
	5- 6-37	50	8			
29	1-21-37	25	32	Negative	Negative	
	4-22-37	25	16			
30	1-21-37	70	128	1-12-37 upper resp. inf. temp. 103.6°		Eliminated as contact, considered clinical case
	4-22-37	30	64			
31	1-21-37	140	16	Influenza 1919	Died 4-4-37	Cardiac death

TABLE III—(Continued)

Serological Reactions in Normal Human Contacts

Contact No.	Date of Bleeding	Titer of Neutralizing Antibodies	Titer of Complement-Fixing Antibodies	History Prior to First Bleeding	History Subsequent to First Bleeding	Comment
32	1-21-37	0	0	Influenza 1922		
	4-22-37	6	0			
33	1-21-37	60	128	Negative	Negative	Probably sub-clinical infection
	4-22-37	240	128			
34	1-21-37	100	64	Influenza 1923	Negative	Sub-clinical infection?
	4-22-37	60	16			
35	1-21-37	35	16	Influenza 1918	2-17-37 ill 2 days malaise	Probably not influenza
	5- 7-37	60	8			
36	1-21-37	6	16	12-12-36 2 days temp. 100° ?		Probably not influenza
37	1-21-37	240	64	Negative	Negative	High antibody suggests sub-clinical infection
	4-22-37	200	64			
38	1-21-37	17.5	32	Negative	Afebrile cold 3-10-37	
	4-22-37	30	32			
39	1-21-37	50	32	Negative		
40	1-21-37	60	64	Influenza 1918	Negative	Eliminated as contact; considered clinical case
	4-22-37	60	32	Influenza 1 day 1937		
41	1-21-37	60	32	Influenza 1932	Cold March, 1937	
	4-22-37	100	64			
42	1-21-37	8	16	Negative	Cold in March	
	4-22-37	6	8			
43	1-21-37	240	64	Influenza Jan. 1937	Negative	Eliminated as contact; considered clinical case
	4-22-37	120	16			
44	1-21-37	4	8	Influenza 1918		
45	1-21-37	12.5	16	Negative	Negative	
	4-22-37	17.5	8			
46	1-21-37	25	32	Negative	Cold in March, 1937	
	4-22-37	60	32			
47	1-21-37	60	32	Negative	Negative	
	4-22-37	120	32			
48	1-21-37	6	0	Negative	Cold April 1, 1937	
	4-22-37	15	8			
49	1-21-37	8	16	Negative		
50	1-21-37	0	32	Negative		
51	1-21-37	15	0	Negative	Cold in Jan. 1937	
	4-22-37	10	0			
52	1-21-37	6	16	Influenza 1918	Strep. throat 4-1-37	
	4-22-37	16	0			
53	1-21-37	15	32	Frequent colds; no definite influenza	Colds and bronchitis; no suggestion of influenza	Probable case of influenza
	4-22-37	120	64			
Average (eliminating 5 clinical cases):						
Total of 48 1st sera		58.5	38.5			
39 1st "		60.2	39.8			
39 2d "		63.7	28.9			

increase in neutralizing antibody titer was noted in the second test. In general, however, the titers were little altered from those of 3 months previous. The average titer of neutralizing antibodies in these 39 cases was 63.7 and the average complement-fixation titer was 28.9, in comparison with titers of 60.2 and 39.8, respectively, in their earlier tests. A number of minor changes in the range of a single dilution were observed, but 31 of the sera remained essentially unchanged in neutralizing titer, 15 in complement-fixation titer, and an additional 18 increased or decreased to the extent of

one dilution in complement-fixation titer. Furthermore, 9 instances of colds or other upper respiratory infection occurred in the month preceding the second bleeding but in no instance did these experiences cause significant deviation in the titer of antibodies to influenza virus.

The additional tests add little in the way of information except to show that perhaps 10 of these patients had undergone asymptomatic infection with the virus of epidemic influenza and that in 2 patients (Nos. 27 and 53) actual clinical infection ensued. In Contact No. 17 the high original titer and the sharp fall clearly indicate that this individual had been infected. The majority of the patients, however, appear not to have suffered from the disease despite the absence of high antibody titers. This field of inapparent infection and resistance will require much further study.

THE PERSISTENCE OF ANTIBODIES

In a previous report[1] was detailed the persistence of a comparatively high level of neutralizing antibodies in 3 patients for a period of 5 months after recovery. The serum of 1 of these subjects has been studied at intervals for a period of 2 years without showing an essential fall in titer. Nevertheless, little is known regarding the maintenance of antibody levels following infection. To study the rate of decline in antibody titer, serum was obtained from 32 of the patients who had previously shown increased antibody formation in early convalescence. Tests were made of the third serum samples, using the second sample of serum of the patients for comparative controls. In 11 instances the third bleeding was secured 2½ to 3 months after the original sample, the remainder 3½ to 5 months after the original.

It was found that after this interval a decline occurred in the average titers of neutralizing and complement-fixing antibodies to about half the level of early convalescence. The average titers of neutralizing antibodies in the first, second, and third samples were 21.2, 305.5, 162.3, respectively; of complement-fixing antibodies 11.5, 230.4, and 113.3, respectively. Little difference was observed in the extent of antibody decline between the sera tested at 2½ to 3 months and those of 3½ to 5 months.

With either test and at either time interval the average decrease was approximately 50 per cent. Twice, an increase of one dilution level was observed with complement-fixation, but none with the neutralization test. Otherwise a surprising parallelism exists within certain limits in the percentage decline by both methods. A decline in titer of neutralizing antibodies is usually associated with a parallel fall in complement-fixation titer. On the other hand, the complement-fixation titer may decrease without an accompanying change in neutralizing antibodies. Thus, in 17 instances no essential difference was observed in the titer of neutralizing antibodies of the early and late convalescent sera while all but 5 of the complement-fixation determinations showed decrease in titer. In 12 instances of the 27 in which complement-fixation titer decreased, it was only to the extent of one dilution level.

In the neutralization tests one other point stands out: Of the 11 patients whose neutralizing titers in early convalescence were 120 or below, only one showed a significant decrease in circulating antibodies in late convalescence. The relative decrease in the entire group was much more at the expense of those individuals who reached high antibody levels in early convalescence. This comparative stability of the lower titers seems to indicate

TABLE IV

Titer of Antibodies in Serum 2½ to 5 Months After Recovery

Case No.	Interval Between 1st and 3d Bleedings (Months)	Titer of Neutralizing Antibodies			Titer of Complement-fixing Antibodies		
		Acute	Early Convalescence	Late Convalescence	Acute	Early Convalescence	Late Convalescence
6	4	0	140	70	0	256	128
8	4	6	200	140	0	128	256
11	5	15	400	60	..	...	...
12	4	15	640	200	8	256	64
15	3½	17.6	640	160	0	128	32
16	3½	15	640	640	..	512	256
18	2½	6	640	140	0	128	32
19	2½	6	60	70	8	64	64
20	2½	0	30	25	0	256	256
21	2½	17	80	50	32	128	256
25	2½	6	640	280	0	1,024	512
26	3	15	640	200	64	512	128
27	3	8	140	50	8	512	128
28	4	30	200	240	64	128	64
29	2½	0	640	240	0	1,024	512
30	2½	12	280	100	32	512	256
33	3	40	120	120	0	8	0
34	2½	4	100	60	8	16	0
38	5	0	15	15	8	64	32
44	5	15	120	60	8	32	16
45	5	200	640	640	8	64	32
47	5	50	640	280	16	128	64
48	5	50	320	240	0	64	16
50	5	30	100	100	0	64	16
51	5	15	640	120	0	128	32
54	5	0	35	30	8	512	128
55	5	6	50	35	16	64	16
58	5	30	206	240	32	128	64
61	4½	15	100	100	0	16	16
62	4	6	240	120	8	128	64
63	4	30	240	320	8	128	64
79	4	20	200	50	8	32	8
Average		21.2	305.5	162.3	11.5	230.4	113.3

that the high titers represent an overproduction of antibody. The fact that many of the numerically lower titers in convalescent serum were from those individuals without antibody originally suggests that perhaps the possession of a certain amount of antibody before infection leads in general to higher titers in convalescence. The tendency of the neutralizing antibodies to decrease less rapidly than those of the complement-fixing type is of interest since the latter appear to reach their maximum titer earlier than the former, frequently before a significant increase in neutralizing antibodies is detectable.

The observations in this group of patients reveal that an average decrease of 50 per cent in the antibody titer occurs in 2 to 5 months, but this is more uniform in complement-fixing titer than in the neutralizing titer. Moreover, the decline in titer by neutralization test appears to be more common in individuals whose early convalescent sera reached the higher ranges while titers below 120 are more persistent.

DISCUSSION

The results of studies in the present series of 120 patients suffering from respiratory disease during the influenza epidemic of 1936–1937 serve to place the diagnosis of epidemic influenza on a firm basis. Thus, the diagnosis of epidemic influenza was made in 100 of 113 cases concerning which sufficient data were available for interpretation. Throat washings were obtained from 64 of the influenza patients, and in 52 (81 per cent) of them influenza virus was demonstrated. In 12 patients from whose throat washings virus was not recovered and in 36 additional patients from whom no throat washings were obtained, a diagnosis of influenza was made on the basis of serological reactions.

Serum was obtained early in the acute illness and in convalescence from 41 patients whose throat washings were found to contain the virus of epidemic influenza. Parallel titrations of the antibody content of the sera were made by the neutralization test in mice and by complement-fixation. It was found that the titer of the convalescent serum had increased, on the average, to a level 10 times as high as that of the acute serum. Consequently, a similar sequence of events in the serum of other patients even in the absence of virus recovery was considered diagnostic. On the other hand, in 11 patients whose throat washings failed to yield virus and in 2 from whom throat washings were not available, the absence of antibody response indicated that these patients had not suffered from epidemic influenza but from respiratory infections of different etiology.

In analyzing the results of the serological tests, it was interesting to note that when tested by either the neutralization or complement-fixation test the titers in the great majority of acute sera were less than 1:40 and the titers in the great majority of convalescent sera from the same patients were higher than 1:40. These observations suggested that a critical level between susceptibility and immunity occurred in that zone of antibody concentration. Hoyle and Fairbrother,[12] basing their opinion on differences in the antibody titers in the serum of the general population before and after an epidemic have concluded that such a level does exist. Moreover, Smorodintseff, *et al.*[13] reported that normal subjects with little or no circulating antibody were readily infected experimentally, while subjects with relatively high antibody titers were resistant. The sera of 48 individuals who had been freely exposed but who had not been ill were tested, therefore, to determine whether their resistance was reflected in any characteristic antibody titer. Interestingly enough, it was found that while a certain number of the results were in the usual range of the acute sera and others in the range of convalescent sera, the greater number of the contact sera congregated in a zone between the acute and convalescent sera and comprised a statistically distinct group. Subsequent study of sera obtained 3 months later from the same individuals suggested that perhaps 10 of them had undergone infection of sub-clinical severity while 2 had actually experienced clinical influenza. Furthermore, it is not unlikely that the higher titers originally observed in this group were a result of inapparent infection. Despite the fact that individuals with little or no circulating antibody escaped infection and that in certain clearly established cases a high titer of antibodies was present at the time of infection, the evidence that a rather distinctive antibody level obtained in the serum of non-infected contacts lends credence to the impression that within flexible limits the antibody titer may be related to the state of resistance.

How long the immunity developed

as a result of an attack of influenza persists is still unknown. In the present series of cases a surprisingly large number of patients, most of whom were adults, had no recollection of a similar illness and comparatively few gave histories of frequent, repeated attacks. Reference has already been made to an individual observed for a period of 2 years after a proved attack of epidemic influenza, who maintained a constant antibody level. From 32 of the patients whose sera were tested in the acute and early convalescent phases of the disease, serum was again obtained and tested 2½ to 5 months later. The average titer by both complement-fixation and neutralization tests had declined about 50 per cent below the level attained in early convalescence. This decline was most regular in the complement-fixation results but in both tests the most marked, and usually parallel, drop was observed in the sera of those individuals whose sera reached the highest titers originally. On the other hand, little change was noted in the titer of neutralizing antibodies among individuals whose titers had not exceeded 1:100 in early convalescence. It appears that these moderate titers are maintained more consistently than the extremely high titers which probably represent immunological over-production. Final opinion regarding the duration of immunity and the persistence of antibodies awaits, however, a much longer period of observation and study.

SUMMARY

A final diagnosis of epidemic influenza was made in 100 patients suffering from respiratory disease during the epidemic period of December, 1936, to March, 1937. From 64 of these patients throat washings were obtained, and in 52 instances the throat washings were shown to contain the virus of epidemic influenza.

In 48 patients the diagnosis of epidemic influenza was made on the basis of the neutralization test in mice and the complement-fixation reaction. Using the same procedures, it was also possible to demonstrate that certain cases of respiratory disease occurring at the same time as the epidemic were of non-influenzal origin. It was also shown that in patients with prolonged illnesses or relapses the continuation of disease was most probably due to intercurrent infection since the patients when first seen were already convalescent, serologically, from influenza and virus was not recovered from the respiratory tract.

During convalescence the antibody concentration of the serum rises to approximately 10 times the height of that observed in the serum early in the disease. The antibody titers of a group of contacts who experienced no clinical evidence of infection occupy a position midway between the usual acute and convalescent zones.

Extremely mild or sub-clinical infections which may play a definite rôle in dissemination of the disease and in immunity are shown to occur.

The duration of immunity and the relation of antibodies to immunity are briefly discussed.

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Two other papers from the Symposium on Virus Diseases will be published later: Experiments on Antirabic Vaccination with Tissue Culture Virus, by Leslie T. Webster, M.D., and Lymphocytic Choriomeningitis, by Thomas M. Rivers, M.D., Sc.D., and Robert D. Baird, M.D.

On the Nature of Virus Agents*

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THERE is little that discussion can add to the foregoing papers. They are reports of clinical and experimental observations made by a group of the foremost investigators engaged in these problems and represent notable additions to the knowledge of their respective subjects. Comment on such work without correlated experimentation is time wasted. In listening to this symposium, however, one is impressed with the progress in method and scope which has taken place in virus study during the short space of 10 years. Not only has the field expanded until it is as broad, in its clinical and public health importance, as bacteriology and protozoölogy—but there has been a development of technic by which clinical observation, cultural study, animal experiment and pathology have begun to acquire much of the precision and flexibility of that used in the older fields.

We have begun to emerge from the purely speculative phases of this subject and have arrived at a point at which enough facts have accumulated to permit experimentation to take off from a few solid premises. We are through, among other things, with the elaborate regimentation of questionable evidence strained to interpret virus agents as phases in the life cycles of well known bacteria. Also the temptation to give addresses on "Are Virus Agents Dead or Alive?" is growing more feeble as we recognize that this question is not only futile but leads to utterly sterile metaphysical efforts to define life.

In segregating the so-called virus agents from known infectious microorganisms such as bacteria many features have been stressed, notably those of size and filterability, inclusion bodies, extreme specificity, flexibility of tissue specificity and immunological phenomena. As far as the last named are concerned much of the immunological difference between virus infection and bacterial invasions may be eventually explained by the intracellular position of the former. And since we know that virus agents are definitely antigenic and many serological phenomena, such as precipitation and agglutination, have been performed with virus systems, it may well be that eventually the immunological peculiarities may prove to be dependent upon such secondary attributes as size, surface exposures, etc. Even the apparent

* This paper was presented as a Discussion of the foregoing papers.

instability of the virus-antibody union, subject to dissociation by dilution, has been imitated under suitable conditions with bacteria and their antibodies. Much could be said about these problems. But in the present discussion I wish to limit myself to the selection of a few simple facts on the basis of which virus agents can be, if not classified, at least fundamentally described.

Of these the most important are those made in studies on cultivation. It is fair to say that, to date, no one has succeeded in obtaining cultural multiplication of a virus except in the presence of living or viable cells. Thus, stating it conservatively, the multiplication of a virus seems to require either some delicate nutritive constituent of cells or the actual participation of metabolic cell activity. Which is it?

Our own experiences with Schoenbach [1] appear to indicate that the curve of virus growth is roughly proportionate to the active metabolism of the cells in Maitland cultures; and that shortly after the stabilization of the potential in the liquid of such cultures and the practical cessation of oxygen consumption, the virus not only stops multiplying but deteriorates rapidly—that is, diminishes in quantitatively determinable activity—and this even though there may be viable though inactive cells present.

On the work done by Dr. Schoenbach and myself an obvious criticism is that we seem to be drawing conclusions of a fundamental nature from titration curves carried out with a single virus. The important fact, of course, is the parallelism between the quantitative rise and fall of virus and the metabolic activity of the cells. If the maximum virus concentration lags somewhat behind the point of metabolic stabilization, this is quite natural, owing to the fact that the virus titrated is in the fluid of the cultures, and experiments such as those of Haagen [2] with yellow fever virus have demonstrated the expected fact that virus lasts longer in the cells than in the fluid. Eventual discharge of virus from the cells would then account for the lag. We would have carried out daily quantitative virus titrations with other varieties of these agents if this had not been done for us by a number of other investigators. Thus, Webster and Clow,[3] though they give no curves, did all their titrations and transfers of their cultivated rabies virus on the 4th day. Magill and Francis,[4] in cultivating human influenza virus in Maitland cultures with chick tissue and Tyrode solution, found the highest concentration of virus between 36 and 48 hours, with a definite decrease beginning on the 72nd hour; and Haagen,[5] again with yellow fever virus, cultivated in Maitland cultures with normal monkey serum, Tyrode and chick embryo, constructed tables which showed definite drops of titer in the fluid of his culture before the 72nd hour, and similar drops of the virus in the cells on the 4th day. Titration curves exactly similar to our own with the equine encephalitis virus have been determined for vaccinia virus cultures by Rivers.[6] *

It is thus evident that in a great many cultures of virus agents the growth curve resembles our own.

It would appear then that virus multiplication requires the coöperation of cell metabolism. This is in contrast with Rickettsiae multiplication on similar media since the latter seem to grow best after metabolic stabilization has taken place but before autolytic or other chemical change of the supporting cells has begun. This contrast is mentioned only because it seems to mark

* It is pertinent to this point also that Rivers and his associates found that tissue frozen and thawed no longer support the growth of Vaccinia virus. Rivers, T. M., Haagen, E., and Muckenfuss, R. S. *J. Exper. Med.*, 50:181, 1929.

the fundamental dividing line between virus agents and one of the most parasitic of recognized microörganisms. Both are obligatorily intracellular—yet one, the Rickettsiae, seems to require some environment which only the cell furnishes without dependence on active metabolism.

Let us take then as our first fundamental characteristic the dependence of virus agents upon the metabolic activity of the cells in which they multiply. And this characteristic seems to be entirely consistent with the recent discovery of Stanley. However cautiously one may approach the work of Stanley [7] on tobacco mosaic one can no longer question the fact that he has obtained a crystalline protein which one must accept as practically pure virus and for which molecular weight determinations range from over 1,000,000 to as high as possibly 10,000,000 or more while the normal proteins of healthy tobacco plants contains no proteins of molecular weight above 30,000. Northrop's bacteriophage protein, though not crystallized and possibly not entirely pure, has a diffusion rate equal to that of the active agent—is absorbed by susceptible bacteria to the same extent as the phage principle and is not absorbed by resistant bacteria. And for this active protein Northrop [8] postulates a molecular weight of about 500,000.

We have no comparably reliable data concerning any of the virus agents of mammalian disease. But that some of them are chemically similar to the mosaic virus and bacteriophage is apparent. A good many years ago Clark [9] carried out partial purification of poliomyelitis virus by ammonium sulphate precipitation. And recently we have repeated and extended this work by methods analogous to those used by Stanley—though rendered more difficult because this virus can be obtained only in the form of monkey brains. But even as far as this work has gone, the monkey injections, carried out for us by Dr. Aycock, have shown that the active agent can be precipitated out of alkaline brain extracts by 35–40 per cent ammonium sulphate, followed by dialysis, re-solution and re-precipitation with acid at about pH 4. Again, the active virus was obtained by ammonium sulphate treatment followed by alum precipitation, re-solution with sodium citrate and dialysis.

Such incomplete observations have only discussion value. But they at least indicate analogy in resistance and behavior of some of the mammalian agents to those studied by Stanley.

At any rate, from the facts ascertained we have reason to believe—if not as yet to know with certainty—that some virus agents behave like proteins of large molecular size. Combining this with what we have learned about the dependence of their multiplication upon metabolic cell activity, Stanley's conception gains significance. Stanley has postulated what is known as "autocatalysis," by which he suggests that the plant protein is "polymerized," or "directly synthetized" to the molecularly higher virus protein; and when such a larger molecule has once been either formed or inoculated in living tissue it functions as a catalyst for its own reproduction.

If, on conventional grounds, it is not easy to conceive that mere polymerization of cell proteins should render it antigenically heterologous, we should remember that the assumption is not without experimental analogy. That purely physical modifications can bring about specific antigen alteration has been suggested in work with "heat" precipitins and in that of Marcheboeuf and Basset [10] who found that horse serum subjected to high pressures becomes antigenically modified.

In this connection much is to be learned from Northrop's enzyme

studies. Northrop [11] has shown that inactive derivatives of enzyme proteins —acetyl-pepsin and heat inactivated trypsin among others, can be converted into the active form by relatively simple chemical alterations. In other words some enzymes can form themselves from inert proteins and, in such change, at least in some cases, there is no splitting of the molecule but merely some internal rearrangement.

The analogy with Stanley's suggestion is obvious and, if one favors such a view, the "inoculation" with a virus would represent merely the supplying of the initial unit of one of the products of the reaction which is essential for autocatalysis. In connection with such speculation we may call attention, in passing, to our own work, with Seastone,[12] since confirmed by Perdreau,[13] on the partial reactivation of herpes virus deteriorated by exposure to air by reduction with cysteine.

The field of virus research has presented so many extraordinary phenomena not readily approached by conventional methods that it has, quite naturally, stimulated much speculation. I do not intend to swell the speculative literature by still another theory. But I believe that in order to formulate experimental approach we should endeavor to incorporate our views of the virus diseases into an orderly system in relation to the so-called infectious diseases in general.

If we emancipate ourselves, for the moment, from the conception that infectious disease—or let us say parasitism, is always a state in which a purely extraneous unit multiplies by independent metabolic processes at the expense of the host—we can arrive at a gradation of the conception of "infectious agents" somewhat as follows:

At one end of the scale there are metabolically independent units such as bacteria—which can thrive and multiply both in the body and on artificial media. More strictly parasitic than these are invaders which depend for multiplication and metabolism more and more closely upon the specific environmental conditions in the animal body. Still more severely dependent are the next class—like the Rickettsiae which appear to require intracellular conditions but still appear to be capable of multiplication by their own metabolic processes. It is only a step from these to the virus agents which multiply intracellularly and cause pathological injury but appear to depend for increase and survival upon the coöperation of the metabolism of the invaded cells. If this premise proves to be precise—some conception related to that of Stanley is inevitable—and here lies the physiological differentiation of virus agents from known microörganisms. Analogy to the formation of enzymes is obvious.

These considerations are not set down as a theory. They are outlined because it seems wise from time to time to reorganize our views for purposes of guiding experimental attack. Moreover they arouse the hope that virus investigation may eventually contribute important conceptions to fundamental problems of evolution.

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Prevention of Poliomyelitis

THE following suggestions are the result of a meeting of the Advisory Committee to the Department of Public Health on acute anterior poliomyelitis at the San Francisco Hospital on September 8, 1937 (J. C. Geiger, M.D., Director of Public Health, City and County of San Francisco):

The recent widespread publicity given to the use of zinc sulphate spray in recent outbreaks of poliomyelitis (infantile paralysis) throughout the country has caused considerable interest locally among parents, who, looking forward to a possible increased incidence of the disease on the Pacific Coast, naturally desire to avail themselves of any aid in preventing it. Dr. Schultz, of Stanford University, by extensive experimental work, has demonstrated that 1 per cent solution of zinc sulphate, 1 per cent pontocaine, and ½ per cent sodium chloride in distilled water is the best chemical spray, experimentally on monkeys.

There is definite evidence that such preparations, when properly applied, will afford a remarkable degree of protection to *monkeys*. Whether this will follow in the case of the human being has yet to be determined. The use of this method must be strictly limited until the proper technic has been worked out, as the method of application is definitely unsettled at present.

Attention is called to the possible side action of the local anesthetic, and the physician giving the treatment should be on the lookout for symptoms of poisoning. Attention is further called to the hazards of using a long-tipped atomizer in the vicinity of the cribriform plate. This method also is impracticable in the cases of small children, for whom the instillation of the solution in the Proetz position is advocated. It is particularly pointed out that any attempts at home medication are absolutely valueless.

It may be deemed advisable to make a preliminary application of a substance such as ephedrin to shrink the mucous membranes before applying the zinc solution. The local anesthetic and the shrinking agent could be used together. The injections should be given once every 2 or 3 weeks, as determined by a returning sense of smell. No change in the constituents of the solution should be made without investigation as to the experimental result on monkeys.

It is recommended that the use of this solution be optional with the family of actual contacts to the disease. The treatments shall be conducted in centers to be determined at a future date. These centers will be under adequate supervision, and any physician who wishes to learn the technic can attend and be instructed by a proficient specialist. A record of all treatments given in these centers shall be kept and, in addition, there shall be a follow-up of the patients receiving the treatment. Zinc sulphate spray, if used at all, must be under the direction of a competent physician, with the understanding that it is used on an experimental basis only.

EDITORIAL SECTION

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OUR SIXTY-SIXTH ANNUAL MEETING

THE Sixty-sixth Annual Meeting of the American Public Health Association will go down in history as one of the most important and most successful that have ever been held by this Association. Never have we had such a large attendance, never has there been such acute interest, and never have the individual sessions been better attended. The wealth of material presented has been puzzling and one is forced to wish that he had a multiple personality so that he could attend at least a half dozen sessions at the same time.

It is impossible to consider the meeting proper without some mention of the various interesting functions and happenings which have been offered to the entire membership or to special groups of our members. The week before the formal opening we had The Health Education Institute, which for a number of years has been sponsored by our Association. This year it excited a great deal of interest and was largely attended—we believe the largest attendance on record. A special report will be made of this later.

On the day before the formal opening of these sessions a considerable number of members were invited to the opening of the Central Harlem Health Center. This is the sixth of the thirty health centers of New York City to be put in operation by 1945, opened under the administration of Mayor LaGuardia and under the supervision of Dr. John L. Rice, Health Commissioner of the city. The special importance of this center lies in the enormous increase of Negroes occupying that part of the city, estimated now at approximately 250,000—almost a special racial problem.

The first general session was held on Tuesday with Dr. Thomas Parran, President, presiding. We had a very unusual experience in having no absentees from the list of speakers. Governor Lehman of New York gave a masterly address on public health which struck a responsive chord, and he once again gave evidence of that great interest in public health he has shown during his

entire administration. He was followed by Mayor LaGuardia, who like Governor Lehman has shown an unusual interest in the welfare of the public. The formal address of the evening was given by Dr. Livingston Farrand, recently retired President of Cornell University, whose interest in public health has long been known.

Another most important dinner meeting was held on Wednesday evening by the National Society for the Prevention of Blindness at which many of the members of the Association were present. Forty-one states of the Union and the District of Columbia were represented at the tables. The meeting was designed for executive health officers but in addition to these there was a large attendance of those interested in public health in general.

An interesting feature was the luncheon given in recognition of the fifteenth anniversary of the Health Education Section of our Association, designed in honor of Mr. Evart G. Routzahn, who has always been active in our service along these lines.

It may seem invidious to pick out any special sessions for mention above others. There have been a number of special sessions of more than usual interest. We hope we may be pardoned for selecting for special mention the one held on Wednesday afternoon entitled "Public Health Advances," at which was given an admirable address on the beginning of the public health movement in this country, followed by other papers tracing our advancement along several special lines. The last paper in this program discussed a projected feature for the World's Fair to be held in 1939, namely the Medical and Public Health Exhibit and the Museum of Hygiene. Germany has at present in Dresden a wonderful Museum of Hygiene which has been visited by many of our members, and some of the exhibits have already been brought to this country. It is intended not only to reproduce for the World's Fair much of this exhibit but to add to it so as to bring to the twenty million people who are expected to visit the Fair ocular demonstration not only of the form and functions of the human body but its needs for attaining its highest development.

The Scientific Exhibits of the Association at this meeting have been the most extensive and the best ever presented. It is impossible here to describe them or even to give a fair idea of them—more's the pity. They have been widely visited by thousands and we cannot but believe that an enormous amount of information has been given by them. Too much praise cannot be extended to those responsible for this feature of our meeting.

The Commercial Exhibits have been extensive and excellent.

The Annual Banquet on Thursday night, attended by more than 750, ended the general sessions. The President-Elect Dr. Arthur T. McCormack, Health Officer of the State of Kentucky, was inducted into office, succeeding Surgeon General Thomas Parran as President of the Association, and gave his annual address. All are familiar with his facile way of presenting topics, to which this was not an exception.

The entertainment provided for the members of the Association has been plentiful and varied. The visiting ladies were provided for by a special committee, and there were trips to many points of general interest. In addition there were others for specialists in the various lines of public health—slum areas, historical houses, to laboratories of various sorts, public health and otherwise, to filter plants, to water supplies, sewage plants, and various health centers. One of special interest was that to the marvelous Holland Tunnel and its ventilating

system, which was designed after very careful study by engineers and physiologists and which has been most successful. We wish it were possible to go into more detail but lack of space prevents.

We were fortunate in entertaining a distinguished group of foreign visitors representing the League of Nations, England, Canada, Mexico, Puerto Rico, Cuba, Germany, and Guatemala.

To the officers of the State of New York, both lay and medical, who have taken an active interest in the meeting in this the greatest city of the United States, as well as to the officers of this great city and to the citizens in general, we offer our profound thanks for the entertainment which has not been exceeded even at meetings in our Southern land which is widely known for its hospitality and geniality.

ABEL WOLMAN

ABEL WOLMAN, our President-Elect, was born in June, 1892, in Baltimore, Md. His preliminary education was received at the Baltimore City College. He was graduated from Johns Hopkins University as Bachelor of Arts in 1913, and from the same University as Bachelor of Science in Engineering in 1915. In 1937, he was given the Honorary Degree of Doctor of Engineering and made Professor of Sanitary Engineering in the School of Engineering and School of Hygiene and Public Health of his Alma Mater.



Abel Wolman, Dr.Eng.

He has had a wide experience in sanitary engineering, both from the practical and theoretical sides. Since 1922, he has been Chief Engineer of the Maryland State Department of Health, and for 7 years prior to that, held a number of positions in the same department, making special investigations of many sorts. As a result of his studies and investigations, he has written a number of outstanding articles which are quoted far and wide in the profession. His activities have not been confined to his native state, but he has repeatedly been called upon by the national government and has done a great deal of work for it in connection with the Federal Emergency Administration of Public Works. He has also been called upon by states and cities quite far from his home. He has been Lecturer in Sanitary Engineering at Harvard University, Princeton University, the University of Southern California, the University of Chicago, and other institutions of learning. From 1921 to 1937 he was Editor-in-Chief of the *Journal of the American Water Works Association;* from 1923 to 1927 Associate Editor of the *American Journal of Public Health;* in 1924 Editor of *Manual of Water Works Practice;* and from 1929 to 1936 was Editor-in-Chief of *Municipal Sanitation.*

His membership in learned societies, chiefly those connected with his profession, is extensive, including practically all that anyone in his profession should belong to.

It is impossible to speak too highly of his services to this Association. He has served as Chairman of the Public Health Engineering Section and Chairman of the Committee on Research and Standards. He became a member of the Association in 1916 and a Fellow in 1922. In the American Water Works Association, which is closely allied with the American Public Health Association, at least as far as establishment of standards goes, he has served on practically every important committee, and as chairman of most of them. Indeed one wonders how he has done so much and done it so well, as some of the committees on which he has served do not seem very closely allied to the field of the sanitary engineer; for example, he is a member of the Revision Committee of the United State Pharmacopoeia. He has also been very much interested in the training of engineers, and has been Chairman of the Committee on Public Education of the American Society of Civil Engineers.

We wish that space permitted us to give a list of his many positions of honor and usefulness, as well as his accomplishments. We are fortunate in having a man who is so well qualified and stands so high with his professional brethren in his different lines of work as our President-Elect.

SIR ROBERT W. PHILIP—WORLD BENEFACTOR

THIS year is a semi-centennial of great social importance. Just fifty years ago, an unknown young physician, Robert W. Philip, organized in Edinburgh, Scotland, the Victoria Dispensary for Consumption, the first clinic for the diagnosis, treatment, and control of tuberculosis. The occasion is now universally recognized as one of the most important events in the history of the public health movement. The world owes a great debt to Dr. Philip, the extent of which is even today not fully realized.

Robert Koch, by isolating the tubercle bacillus had recently proved that the disease was infectious; but practically nothing was known of the means by which this dreaded affliction could be controlled.

Dr. Philip observed that in the vast majority of cases the presence of tuberculosis was not physically recognizable in its early stages and, consequently, that most cases which came to the attention of the physician were so far advanced as to be beyond medical assistance. He grasped the fact that these cases were centers for the spread of the disease, particularly among the children and other members of the household. He realized that if the disease was ever to be eliminated, it must be attacked at its source, namely, in the homes; that cases must be sought out in their incipiency and cured before they became centers of further infection; that it was not sufficient to wait until cases voluntarily presented themselves for treatment.

Dr. Philip foresaw that it was necessary to establish a communal center to fulfil the double function of searching for and dealing with cases of tuberculous infection. This center, as outlined in his mind, was to serve (1) as a receiving place for medical diagnosis, (2) as a clearing-house for observation and the methodical examination of contacts, (3) as a center for the investigation of environmental conditions and for the general care of tuberculous households, and (4) as an information bureau and source of propaganda. In a word, the clinic

was to be a center linking the various efforts against the disease in the community.

The principles thus laid down, although based upon hardly a vestige of past experience or precedent, have served without essential change as the basis of all effective tuberculosis work since that day.

In 1887, when Dr. Philip first opened his dispensary, tuberculosis was the chief cause of death throughout the western civilized world. In both Great Britain and America the death rate from this disease was then above 250 per 100,000 population. No one has any conception of the enormous economic losses and the widespread misery which this scourge then occasioned. Today, the mortality from tuberculosis in Great Britain has been reduced to 28 per cent and in America to 22 per cent of that prevailing when Dr. Philip first pointed the way toward its elimination. Needless to say, the amount of heart-break and misery has been correspondingly reduced. The economic saving in the field of industry alone has been incalculable.

Philip stands in the front rank of the world's great benefactors. Let us honor him while he is still alive that he may sense our grateful appreciation of a long life spent in the interest of his fellow man.

LETTER FROM GREAT BRITAIN

ENGLAND'S "GOOD YEAR FOR HEALTH"

In presenting "to the King's Most Excellent Majesty" the report of the Ministry of Health for the year ended 31st March, 1937, the Minister (Sir Kingsley Wood) claims that year to have been a "good one for health." There is much in the report to support that claim and to show that a volume of most useful work was done on behalf of the public health, and considerable progress made in a number of directions.

One of the greatest contributions of recent years to better health has been the reconditioning or destruction of vast numbers of unfit houses. In the matter of housing, 1936–1937, the fourth in the 5 year programme of slum clearance, has shown extraordinary activity in this direction. In connection also with the provision of houses to replace slums or to let at low rentals, a record was set up. The actual figures were 71,734 for the former, and 346,047 for the latter. The total capital expenditure on housing since 1919 amounts to £722,500,000, a sum which has been used in helping to erect some 3,000,000 new and decent houses, and to provide improved housing conditions for about one-third of the entire population of England and Wales. Immense as the sum is, it is a part only of the expenditure capable of being regarded as devoted to health; just as housing improvements are part only of the activities that have gone to make the year a "good one for health."

Actually, on public health the net expenditure of local authorities in England in 1934–1935 was over 44 million pounds sterling, and this did not include the amounts spent on housing and other provisions such as water supply, and so on. On housing in 1934–1935 the net expenditure was nearly 17 million pounds.

AN IMPROVED MIDWIFERY SERVICE

General improvement in working conditions, a rising standard of living, more temperate habits of the people themselves, improved water supply and hygienic conditions generally, have all helped to make for better health, but to improved housing great credit must go. Other works calling for recognition as making for progress, and that in fact receive it, include, prominently, those done in relation to maternity and child welfare, disease prevention, to national health insurance, and so on. As indicating their importance, it is the medical welfare services, and particularly works done in relation to maternity and child welfare, that first come under review in the report. Here particular attention is devoted to the midwifery services and the effects likely to follow the operation of the Midwives Act, 1936. This provides for the setting up of a salaried service of midwives throughout the country by the local authorities alone or in conjunction with voluntary associations.

As showing the friendly relations existing between the two sets of bodies, it may be noted that out of the large number of the latter, only a handful were unable to make arrangements for coöperation without reference to the Ministry of Health as a central court of appeal. Actually, what has happened is that in the large majority of county areas, county councils have en-

tered into arrangements with nursing associations, while the authorities of more populous areas for the most part have preferred to employ their own midwives. In any case, the result will be that throughout the country skilled attention will be readily available for women in childbirth.

From all appearances, also, there should be no lack of attention in the antenatal period either, since at the end of 1936 the 371 authorities operating schemes in the country had established 1,568 antenatal clinics. These same bodies had provided no fewer than 3,000 infant welfare centres and appointed 5,280 health visitors. Other welfare activities of the local authorities affect the blind, the deaf and dumb, the mentally deficient and the lunatic, and, according to the report, are having most beneficial results.

SOLVING THE TUBERCULOSIS PROBLEM

Work in relation to disease prevention naturally affected very largely those grouped as communicable. Smallpox remains very much at bay in spite of the fact that the fall in the number of vaccinations and the rise in the number of "conscientious objectors" continue. In all only 12 cases of this disease were notified in 1936. Diphtheria was less prevalent than in the 2 previous years, while an increase in the amount of typhoid fever was entirely the result of an outbreak in a holiday resort, traceable to a contaminated milk supply, the causative agent being a carrier. That the belief of authorities in isolation hospitals persists is evidenced by the fact that the Ministry of Health was called upon to grant approval to a number during the year. Further evidence is available, however, to show that the present policy involves the replacing of small units by larger institutions.

That the efforts made to deal with tuberculosis are proving successful is revealed in the figures relating both to deaths and notifications. The death figures are the lowest ever recorded for pulmonary and non-pulmonary forms, while the cases notified numbered considerably less than in the previous year. Great satisfaction is expressed with the progress made in connection with the tuberculosis schemes of local authorities, which include the provision of sanatorium and hospital beds, the number under schemes now being 29,777. The work done in village settlements and in connection with boarded out children receives great praise.

CANCER AND VENEREAL DISEASE

The fact that, though there are proposals to increase the number of treatment centres (176) provided by local authorities, the total attendance continues to fall, is noted as most interesting. A comparison of 1920 with 1936 shows that there was a reduction of 56 per cent in the number of cases of syphilis, and of 28 per cent in the total number of cases of venereal disease. The 1,802 new cases of congenital syphilis may be compared with the 1,909 for 1936. Cancer, unfortunately, appears in a less favourable light than the venereal diseases, and in the situation regarding it there is less reason for congratulation, since, though advances continue in regard to treatment, these assist not at all so far as the securing of control and prevention is concerned. In the case of the venereal diseases, syphilis particularly, treatment and cure have played an outstanding part in these directions. The problem there, however, is different entirely in its nature from that surrounding cancer, which must await solution until research into causation places something more at the disposal of preventive medicine than at present is available. The situation is that "in

spite of continued and, indeed, intensified medical research, and of undoubted advances in knowledge, the method of causation remains obscure."

THE HEALTH INSURANCE SCHEME

In the section dealing with National Health Insurance, figures of extreme interest are shown. The number of persons insured showed a marked increase, as did also the amount of contributions. In both cases this was a direct result of continued improvement in economic conditions. The number of insured persons which had been 15,772,000 at the end of 1935, reached at the end of 1936, 16,215,000. The increase in contributions was by 4.8 per cent, from £23,141,000 to £24,264,000. The fact that the revenue of 1936 exceeds that of 1932 by approximately £3,000,000, representing 80,000,000 working weeks, is a striking illustration of the industrial progress of the last few years. Amongst statements made with regard to the extent and cost of medical benefit, the following are worth quoting. In 1936 about 15,403,000 insured persons were entitled to medical benefit. They were attended by about 16,000 physicians, and they obtained their medicines and appliances from about 12,000 drug stores. The total expenditure on medical benefit was £9,430,000, of which insurance physicians received over £6,868,900 for attending and treating insured persons, and insurance chemists received £2,084,600 for drugs, etc. The amount expended on grants to enable physicians in rural districts to attend short courses of postgraduate study was £2,450. With the extensions that are to be made in the direction of providing opportunities for such study to panel practitioners, considerably larger sums will, of course, be expended. I have been able only to mention a few of the points in this and other parts of the report which the Minister of Health regards as indicating that the year 1936 was a "good one for health."

A NATIONAL HEALTH CAMPAIGN

That there are possibilities of making its successors even better ones, he appears to be convinced, and with this object in view he made considerable alterations in the design of the report for 1936, transforming it from the more or less dry record that such publications are liable to be, into a volume readable by the man in the street, and an addition to the collection of health education and propaganda material. Having regard to the fact that there was an intention on the part of the Minister and the Ministry to conduct a nation-wide campaign of health propaganda in the six months almost immediately after its appearance, it was useful that the report should be used as one of the publications first to direct attention to the matter. Even more useful was the message which the Minister of Health jointly with the Education Minister, addressed to local authorities on the subject; and most useful, impressive, and effective the address that the Prime Minister himself (Mr. Neville Chamberlain), speaking at a great gathering at the London School of Hygiene, broadcast on the eve of the opening of the campaign on 30th September.

CHARLES PORTER, M.D.

PUBLIC HEALTH EDUCATION*

Thank You!—The return of the A.P.H.A. Annual Meeting to New York marked the completion of the first cycle in the history of the Public Health Education Section which was organized in that city in 1921. This 15th anniversary was marked by a luncheon session in which the editor of this department shared the honors.

The editor thanks those who were kind enough to attend that luncheon and those who have otherwise expressed interest in the 15 year record. And the editor assures every reader that he has had a ggggrand time in doing things with the Section and the *Journal* and in the association with members of the Section and others in the A.P.H.A.

Health Education, October 5–8, 1937—To complete the record that all may read it, here are the health education features and topics found in the final program of the 1937 annual meeting of the American Public Health Association:

The Technical Exhibits, the booths of the commercial concerns, offered a certain amount of data as background information for the health educator, as well as some printed matter usable on occasion.

The Scientific Exhibits, which will be reported elsewhere, presented both popular and professional educational material.

The A.P.H.A. Book Exhibit made available for examination more than 500 books of health interest

Health Education and Publicity Headquarters will be reported elsewhere.

A Motion Picture Program presented professional and popular pictures at hourly intervals.

Press Headquarters, too, served health education by making it possible for newspapers and other periodicals to spread widely many high points in the convention program.

The program of sessions included the following:

Child Hygiene Section: "Evaluating Dental Health Education and Dental Service Programs."

Public Health Association of New York City: an illuminating pageant of public health progress.

Public Health Advancing (a special session) included: "Health Education for Millions" (about hygiene museums).

Health Officers Section (under "What Every Health Officer Should Know") included: "Developments in Public Health Education."

A breakfast session: "Community Education in the Control of Syphilis."

Food and Nutrition and Child Hygiene Sections, and Public Health Nurses (in a nutrition program) included: "Nutritional Education in the Home," and "Education in Nutrition by Private Agencies."

Public Health Today (a special session) included: "The Nurse an Interpreter of Health."

American Association of School Physicians: "Professional Education and Qualifications for the Administration of School Health Programs."

National Organization for Public Health Nursing included: "A Proud Heritage—A Pageant on the History of Nursing."

Radio Program included local and network broadcasting at several periods of 5 days, starting before the convention opened.

Editorial Board of American Journal of Public Health: a session on past performance and future policies.

The Public Health Education Section presented what follows:

Health Education Institute covering parts of 3 days.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N.Y.

"Health Education Exhibits" (a committee report).

"Evaluation of Public Health Education Methods" (a committee report).

Buffet Supper: a delightful opportunity for acquaintance between Section members and friends. Out-of-office sidelights were thrown on about a dozen of our members who told briefly about their hobbies.

"Developing Public Health Education Interest in the *American Journal of Public Health*" was a valuable hearing called by the Section Committee on Publications.

A "Testimonial Luncheon" to the editor of this department included an address on "Public Relations for Public Health."

"Results of Mass Education for Tuberculosis Prevention in Detroit."

"Visual Education for Schools."

"New Program of the National Education Association."

"The Health Education Institute" (a committee report).

"Relations with the Child Hygiene Section" (a committee report).

"Section Objectives" (a committee report).

"The Box-Office Appeal of Health Movies" (with showing of March of Time sequence on cancer).

"Publications for Health Education" (a committee report).

"Window Displays for Health Education."

"Clinic on Printed Matter."

"Clinic on Posters."

We give the health education program in detail because it could not be fully announced in the advance program. We wish to tantalize those who failed to get to New York, hoping that they will start planning to be in Kansas City in 1938. Then we hope that program planners of all the sections will study how health education may be placed on their 1938 programs.

And third, it is hoped that some of the topics listed above may be taken over into various state and national meetings of health workers and of social workers.

The 1937 Scientific Exhibits—The array of scientific exhibits has rapidly expanded in quantity and quality. Represented were the results of research, the high points in new or pressing problems, the graphic portrayal of administrative procedures, the display of services and aids available to health agencies, and examples of popular propaganda.

The exhibits provided object lessons in both good and bad practice in graphic presentation. It would be extremely helpful if the committee could find a way for calling attention to the good points in specific exhibits.

Health Education and Publicity Headquarters, 1937—For some years now health education has been assigned a good sized space for displays and consultation at the Annual Meeting.

Included were numerous classified portfolios with samples and technical information, including a group of exclusive health material made up especially for the occasion. All of these portfolios were provided by the Social Work Publicity Council.

Additional collections came from local, state, and national health agencies. There were new posters or exhibits offered to health workers from state or national sources. A collection of special binders, collected by Baxter K. Richardson of Illinois State Department of Health, outlined and illustrated the press services of the more alert state departments. One scrap book was exhibited by a young woman as an example of what might be done by a lay enthusiast quite without stimulus from a health agency. Marion McKinney, Westchester County Department of Health, White Plains, N. Y., gave several hours every day to a valuable demonstration of the use of the fret saw, and other equipment and materials in making effective placards and posters.

A bad cold kept Mrs. Hilton J. Shelley of the Middletown, N. Y.,

Health Department, from carrying on the demonstration of how to get good and unusual mimeographing.

Motion Pictures at the A.P.H.A.—Probably the most attractive program yet presented at an Annual Meeting was given in New York, October 5–8. A picture was shown on the hour, every hour daily, from 9:00 A.M. through 5:00 P.M. Projection was supplied by A. C. Barnes, 405 Lexington Ave., New York, N. Y., and the program was handled by George Grogan, New York State Department of Health, to whom thanks are due. Here are the pictures:

"Milk Parade with Lowell Thomas." Sound. Story of milk from the cow to the doorstep. Exhibited by Milk Industry Foundation, Chrysler Building, New York, N. Y.

"Modern Dental Care." Silent. Exhibited by Murry and Leonie Guggenheim Dental Clinic, 422 E. 72d St., New York, N. Y.

"Maternity." Silent. Essentials and significance of prenatal care for laymen. Exhibited by South Carolina State Department of Health.

"Germination of Bacterial Spores." Silent. Polar, equatorial, and stretching types of germination shown. Prepared by Dr. S. Bayne-Jones, Dean of Yale Medical School. Exhibited by Dr. Robert S. Breed, New York State Agricultural Experiment Station, Geneva, N. Y.

"The Story of My Life by Tee Bee." Sound version of a well known picture. Exhibited by State Department of Health, Albany, N. Y.

"Science of Modern Medicine." Sound. Syphilis and gonorrhea; reproduction. Exhibited by American Social Hygiene Association, 50 W. 50th St., New York, N. Y.

"Henry Street Visiting Nurse Service." Silent. Seven typical scenes. Exhibited by Henry Street Visiting Nurse Service, 99 Park Ave., New York, N. Y.

"Syphilis, Nature, Prevention, Treatment." Silent. For the general public. Exhibited by U. S. Public Health Service, Washington, D. C.

"The Eighty Years." Sound. Vital moments in history; achievements of science and industry. Exhibited by Bureau of *Nutrition, Borden's Farm Products*, 110 Hudson St., New York, N. Y.

"Morning Until Night." Silent. Infant care for school girls and mothers' groups. Prepared by University of Wisconsin. Exhibited by Wisconsin State Board of Health.

"Parks and Playgrounds of New York City." Silent. Exhibited by New York City Department of Parks, 64th St. and Fifth Ave., New York, N. Y.

"The Invisible Handicap." Silent. Hearing conservation program in New York City schools. Exhibited by New York League of the Hard of Hearing, 480 Lexington Ave., New York, N. Y.

"Syphilis of Central Nervous System." Silent. For the medical profession. U. S. Public Health Service, Washington, D. C.

"Far All Our Sakes." Talking slide film. Syphilis: nature, need for early diagnosis, and care. Exhibited by American Social Hygiene Association, 50 W. 50th St., New York, N. Y.

"Cross Connections That Cause Contamination." Silent. Health preservation through elimination of faulty plumbing. Sponsored by Copper and Brass Research Association. Exhibited by Penfrase Specialties, 101 Park Ave., New York, N. Y.

"Public Health in New York State." Sound. Important projects or activities of 8 divisions of State Department of Health. Exhibited by New York State Dept. of Health.

The New York State picture was shown also at hourly intervals in connection with an exhibit of the State Department. The "March of Time" sequence on cancer was shown at a luncheon of the Public Health Education Section. Motion pictures or slides were shown at various sessions of sections of the Association.

That Was Not Health Education—Due to a misunderstanding as to the nature of the opportunity some teachers encouraged school children to visit the exhibits at the A.P.H.A. Annual Meeting in New York.

We hereby urge that local committees in Kansas City and other future convention cities *take definite steps to discourage such visits.*

Boys and girls with shopping bags, crowding around displays and reaching for whatever printed matter or food samples are available, are not experiencing health education.

The accumulation of miscellaneous advertising matter, professional publications, and printed matter offered for the use of delegates is not particularly helpful to the young people.

During several long periods about all that those in attendance at some booths could do was to try to keep valuable books and other publications from being carried off. During such periods but little professional service could be rendered to delegates.

On the other hand, visits by teachers interested in health education would have been welcomed by many of the technical and scientific exhibitors. Much was to be seen and much was distributed which teachers might use to advantage. So, send the teachers next year, but please make very clear that the children should stay at home.

"Your Health!" a New Radio Program—A notable development in health broadcasting is the *1937–1938* program presented by the American Medical Association and NBC over the Red network. The series of dramatized health messages is intended to furnish graphic supplementary material for health teaching in junior and senior high schools. Much of the material is expected to be usable in the higher elementary grades. Naturally this adaptability to school use should not lessen its interest and value to mothers and housewives.

The program is broadcast every Wednesday from 2:00 to 2:30 P.M., eastern standard time. For a list of stations to which the program is available see *Hygeia,* or write to A.M.A., 535 N. Dearborn St., Chicago, Ill. However, it is important to note that local broadcasts in every community depend solely upon the local station management. Promotion of interest in the series should enlist schools, parent associations, and other interested groups throughout the station territory. Letters and resolutions should be addressed to the station to insure all the broadcasts throughout the season. Here is an excellent opportunity for state departments to back up local efforts through enlistment of interest beyond city limits.

The *October theme is "Personal* Health"; for November, "Hygiene"; with "Diet" in December.

Oct. 13—"Learning about Health"; Oct. 20—"Growing for Strength and Beauty" (favorable and unfavorable factors in growth and the maintenance of normal weight); Oct. 27—"Seeing and Hearing Well" (hearing and vision; how to conserve these; how to recognize deviations; how to prevent loss); Nov. 3—"Striving for Better Bodies" (so-called physical defects; their recognition; what can be done about them).

Nov. 10—"*Playing for Fun*" (health values and hazards in sports and recreation, including football); Nov. 17—"*Fresh Air*, Fresh Clothes and Fresh Skin" (ventilation; clothing; bathing); Nov. 24—"Rest, Relaxation, Refreshment" (all work and no play, or all play and no rest—bad for health); Dec. 1—"Tuberculosis, Foe of Youth" (how bad habits of hygiene and unwise living, plus infection, favor tuberculosis).

Dec. 8—"It Takes All Good Foods" (a well rounded diet and how to get it); Dec. 15—"Vitamins, Minerals and Common Sense" (more about a balanced diet in special relation to minerals and vitamins); Dec. 22—"Dietary Fads" (facts vs. fallacies in relation to prevalent false notions on diet); Dec. 29—"Milk from Farm to Table" (the production, transportation, pasteurization and home care of milk; its place in the diet; processed milks).

Please report any parent listener groups to the editor.

Consumer Studies in High School—Health education in the form of consumer studies of products and advertising in high schools is not new. More recently courses in consumer

economics have given attention to products which may affect health. A helpfully detailed account of one such course is "The Consumer Course at Hiram High," by C. Boroski, in *Junior Red Cross Journal,* Washington, D. C. Oct., 1937. *15 cents.*

Several paragraphs may be quoted to illustrate possibilities in dealing with products of health interest. The class made a study of advertisements in one issue of a metropolitan daily.

> After this study was completed, the tabulated results indicated that there were approximately two dozen advertisements which the class judged as questionable. As 90 per cent of these advertisements were either for medicines or cures of some kind, it was decided to send them to the American Medical Association and ask for an expert opinion on the products advertised. The association responded by sending a statement about each product. . . . Not all of the products were condemned, but the large majority were. The committee in charge of this project pasted each advertisement at the top of a sheet of typewriting paper with the comment of the Medical Association just below it. These sheets were then bound into a booklet to add to the high school's consumer library.
>
> The project was not ended, however. The booklet was sent to the Better Business Bureau of a near-by city with a request for further information about the products. The Better Business Bureau, in reply, said they had nothing to add to the information given by the A. M. A., but asked permission to show the booklet to the advertising manager of the newspaper in which the advertisements had appeared.

Again the class took up toothpastes.

> The whole class read reports of the Council on Dental Therapeutics of the American Dental Association and found that many widely advertised dentifrices are not approved by this association because of the unfounded claims made for the product. The accuracy of advertising claims is very important to consumers because they want to buy a dentifrice on the basis of what it is and what it will do, rather than on some fanciful claim. One committee made rough comparisons of the abrasive quality of tooth powders, and studied the costs of the different brands.

The act to control food, drugs, and cosmetics then being considered by Congress

> . . . came up for extended discussion. Propaganda both for and against the new Food and Drugs Act and copies of congressional hearings on the bills then before Congress were studied. Pictures of exhibits prepared by the Food and Drug Administration, Washington, D. C., showing the limitations of the Food and Drugs Act of 1906, were used for bulletin board displays. We also had copies of the bills themselves so that we could see what an act of Congress looks like. Some of the class wrote their Congressman urging him to support a good Food and Drugs Act.

The idea might well be adopted in part by teachers of health education, and the plan as a whole may find a place in certain groups of adults. School clubs might be interested, and it might not be difficult to gather groups of young adults for the purpose of pursuing studies and experiments such as are described in the article.

That such study is needed receives emphasis from the publication of an article on advertising and merchandizing in a recent issue of a professional health journal. According to the author "self-appointed consumer defenders" make "absurd" claims. During the food and drug control battle in Washington the "self-appointed producer and advertiser defenders" were so "absurd" in their statements that a leading advertising magazine repeatedly rebuked them. And after the battle was over numerous advertising and trade associations expressed warnings to their members against doing what the public had previously been assured did not occur. Much in the article is illogical, or based upon limited understanding of the subject.

Even small groups of high school students who have done first hand study of consumer problems with a health angle should bring strong reinforcement to public health education.

Good—But Better Next Time—The annual report of Fresno County Health Department, Fresno, Calif., is well mimeographed in 10 pages. It represents the simplified and inexpensive form which might be adopted by any county or small city department. Hence we venture to point out how Fresno or any other county might do the same report a bit better another year.

1. Discard the conventional, dull looking, near white, mimeograph paper, using a tinted paper of which there is a variety made for mimeographing. Or a light weight bond, inexpensive and agreeable in appearance. (A list of some suitable papers will be supplied if you care to send an addressed and stamped envelope to Social Work Publicity Council, 130 E. 22d St., New York, N. Y.)
2. If you could add just a little to the cost, use a printed cover, or one done on the multigraph with display type made for multigraph use.
3. Run the two pages of text in advance of the statistical tables.
4. Allow the two pages of text to run part way over a third page, so that the pages will not run so close to the top and bottom.

We believe that even two or three of the above suggestions would add much to the appearance of the report in proportion to the cost.

Syndicating Health Information—The "Annual Directory of Syndicated Features" appeared as a supplement to *Editor and Publisher,* Times Bldg., New York, N. Y. Sept. 25, 1937. *10 cents.*

The authors of health columns are given here as they are listed in the Directory:

"Dailyette," by John C. Kraus; "Dr. Bundesen—Health," by Herman Bundesen; "Family Doctor," by J. J. Gaines, M.D.; "Health," by Dr. Cutter; "Health and Beauty," by Dr. Sophia Brunson; "Health Column," by Dr. Logan Clendening; "Here's to Your Health," by Dr. Frank McCoy; "Housing Clinic," by Dorothy Ducas, Elizabeth Gordon; "How's Your Health?" by Dr. Iago Galdston; "Keeping Fit," by Artie McGovern; "That Body of Yours," by Dr. James W. Barton; "The Family Doctor," by Dr. Morris Fishbein; "Weekly Article," by John C. Kraus; "Your Good Health," by Dr. C. N. Chrisman; "Your Health and Your Weight," by Dr. James Barton; "Your Health," by Dr. Royal S. Copeland; "Your Health," by Dr. Robert B. Stewart; "Your Good Health," by Dr. C. N. Chrisman; "Your Health," by Dr. Alexander Goodman; "Your Weight and Your Height," by Dr. James B. Barton.

A certain amount of health material will be found in some columns in other classes: beauty, children, food, science.

The Directory also lists news services, photographic services, etc.

Incidentally, Dr. Galdston's column is syndicated by Associated Press Feature Service, and not by the New York Academy of Medicine.

Why Addresses Are Given—We try to give usable and easily understood addresses for most every publication or activity mentioned in this department of the *Journal.*

This is done so that readers may find it easy to write to any agency or other source to which reference is made.

In a few cases we mention something without an address, either because none is available without too much effort, or because it is not worth while to write for what is mentioned.

The editor of this department does not supply anything unless his address is given specifically for that purpose. It will save you time and extra trouble if you address your letters direct to whoever or whatever is named as the source of the material in which you are interested.

There Is Nothing To Take Its Place—At least we know of nothing available which might replace the series of bibliographies, issued first by American Child Health Association, and more recently by School Health Education Service. In addition to their un-

equaled form, they were revised annually, and so could be kept up to date in contrast with the reading and source lists contained in health education books.

School Health Education Service has been wholly discontinued. No further correspondence should be addressed to it. We can only hope that the American Association for Health and Physical Education, a reorganized department of the National Education Association, may revive some of the discontinued services.

Health Education in Journal, October, 1937—In "The Early American Public Health Movement," by Shryock, mention is made of the national sanitary conventions (page 969):

. . . the members of the conventions were alive to the need of educating the public, although this is now viewed as a "recent" function of health administration. To this end, they encouraged the formation of "sanitary associations" in large cities, similar to the "health of towns" societies in Great Britain. An apparently flourishing association of this sort, set up in New York City before 1860, was active in the drive which finally led to the reform of health administration in the metropolis.

In "Vaccines Against the Common Cold," by Bristol (page 987):

. . . reducing absenteeism due to colds is an undertaking that requires the coöperative efforts of individual employees and of management. The employees' responsibilities should be concerned with learning everything possible with reference to colds and their prevention, control, and medical treatment; and putting the knowledge gained into continuous practice. Management's opportunities in such a coöperative program will be found largely in assisting employees to learn all of the facts regarding colds; in calling attention periodically to the seriousness of the problem and the need for medical care; . . . all of which involves a well rounded program of health education . . .

In "Is Routine Examination and Certification of Food Handlers Worth While?" by Best, the 4th in a 5 point program of protection for the public is stated on page 1006 to include instruction in personal hygiene, instruction in handling food, and the provision of instruction pamphlets and placards. Practical details are outlined.

In "Books and Reports" see (page 1054) a review of "Group Leadership."

On page 1064 is an announcement of "Health Conservation Contests for Syphilis and Tuberculosis."

Hygeia, September, 1937 — For education and reference see in *Hygeia*, 535 N. Dearborn St., Chicago, Ill. (Sept., 1937; *25 cents*):

Learning about health (what people don't know) . . . The health chaser (the hypochondriac) . . . What can be done for arthritis? . . . Can diet influence cancer? . . . Sinus disease . . . Sane manias: hobbies of varied personalities . . . Don't let your child get fat! . . . Bad habits in good babies . . . Dressing up the diabetic diet . . . Gelatin: the chameleon of foods . . . Thomas Sydenham (father of clinical medicine) . . . New books on health . . . Typhoid (in story form) . . . X-rays and radium in medicine . . . Questions and answers.

Under "School and Health":

Getting perspective in health education . . . The school physician and classroom teacher coöperate . . . Laying the groundwork for a nutrition program . . . Health heroes of the past speak (a school broadcast) . . . All in the day's work (as seen by a health teaching supervisor).

DATES AHEAD

November brings the high point in the 1937 Mobilization for Human Needs, including the raising of funds for many private health agencies.

Nov. 11: Opening of Red Cross Roll Call.

Nov. 14–21: National Book Week. Effective planning may bring desirable books for health institutions, and may result in the display and sale of ap-

proved health books, and may offer some opportunities for advising against undesirable books.

Nov. 25: Thanksgiving Day may stimulate some original minds to putting the Thanksgiving health message into some new form.

Nov. 26: Christmas Seal Sale begins.

Dec. 22: The first day of winter, providing the opportunity for a new accent on cold weather health needs.

The health officer and the health association executive may usually find some reasonable tie-up with the above and other events. In some cases a few words expressing a common interest and appreciation will be worth while.

And in community celebrations health executives or other representatives of health agencies should be found upon the "general" or "advisory" committee, as well as among the group which plans any feature which has a health angle.

MOTION PICTURES

New pictures produced in other countries are announced under "Public Health Administration" in *Venereal Disease Information,* U. S. Public Health Service, Washington, D. C.

"Animation Made Easy," by F. C. Houghton, explans how an average amateur may produce simple animation effects. In *Movie Makers,* 420 Lexington Ave., New York, N. Y. Sept., 1937. *25 cents.*

"Nurses in the Making" is a vocational guidance film of interest to girls and their adult friends and advisers. It is 2 reels, silent, 16 mm., produced by Harmon Foundation, 140 Nassau St., New York, N. Y., in coöperation with New York Hospital School of Nursing.

Beginning with scenes showing some of the fields of service open to the nurse today, the film answers the questions, "What sort of girl should be a nurse?" and "What are the requirements for admission to a good school of nursing?" The major portion of the film portrays highlights of a modern nursing curriculum.

The picture takes the nurse through her hospital training, her experience in the outpatient department, 2 months with a visiting nurse association, and a period of care of patients with mental disorders.

BOOKS AND REPORTS

Diseases of the Heart—*By Sir Thomas Lewis. New York: Macmillan,* 1937. 289 pp. Price, $3.50.

No one connected with medicine needs enlightenment concerning Sir Thomas Lewis, the illustrious author of this book, which is a concise and simply written account of his very wide experience in the study of heart diseases. It is based on what he has seen and found to be true in a wealth of clinical material.

Dr. Lewis purposes to acquaint the practitioner with the common cardiac conditions, their diagnosis, treatment, and management. He considers all the important ailments of the human heart, including angina pectoris, pulse irregularities, arrhythmias, essential hypertension, and the thyrotoxic state. The chapters of arrhythmias, cardiac asthma, and essential hypertension are the high lights of the book.

The chapter on Essential Hypertension is prefaced with a general statement about high pressure, setting forth the various conditions with which it might be associated. Brief discussions of the pathological anatomy of the body in hypertension, including hypertrophy of the heart, arteriosclerotic and renal changes, follow. Next are given the symptoms found in hypertension, emphasizing that it is not unusual to discover hypertension in routine examinations conducted for insurance or other purposes, although such patients may have few, if any, of the usual symptoms. Emphasis is laid on well known symptoms such as headache, nervousness, fatigue, palpitation, and disturbances of vision. The careful practitioner may recognize high blood pressure in various ways, including detection of accentuation of the second cardiac sound, high pulse tension, and sphygmomanometry.

While the author, by repeated illustration and reference, emphasizes the value of electrocardiography, the inclusion of an entire chapter on this subject, written in the same simple and concise style, would be welcomed by the medical profession.

Particularly valuable for everyone are the bits of counsel found in the section on "Conversing with the Patient and His Friends," and the statements reproaching the profession for its neglect of early signs of heart disease.

Students and practitioners alike will find this volume invaluable. No one can turn its pages without marveling at its content and form. Unimportant matters not belonging in such a masterful presentation are omitted. Its striking simplicity and conciseness make this second edition one of the most outstanding contributions to medical literature on the ailments of the human heart. WILLIAM B. BROWN

Psychiatric Social Service in a Children's Hospital—*By Ruth M. Gartland. Chicago: University of Chicago Press,* 1937. 105 pp. Price, $1.25.

This volume gives an account of 2 years of service rendered children in the Child Guidance Clinic of Bobs Roberts Hospital of the University of Chicago Clinics. An introduction deals with the recognition of the necessity for combining psychiatric and pediatric knowledge and skill in the furtherance

of the growth and development of children and with the functions of the psychiatric unit.

Then follows a statistical analysis of patients referred and treated, a discussion of concerns of patients and parents, services rendered, and changing treatment trends with case illustration. Implications of this study, given in the conclusions, are related to future clinical procedure, and to service in the community.

The report will be of special interest to those public health workers who are giving consideration to community mental hygiene programs and to the social aspects of public health.

Many pages of the book are difficult to read because the lines are too long and close together for the size of type and offset process used. It is unfortunate that such a constructive analysis of a timely subject could not have been printed according to standards which would pass the scrutiny of the National Society for the Prevention of Blindness. IRA V. HISCOCK

The Traffic in Health—*By Charles Solomon, M.D. New York: Navarre Publishing Company, Inc.,* 1937. 393 pp. Price, $2.75.

Even those who have followed the campaign of the American Medical Association against quackery, frauds and fakes have something to learn from this book. It shows a vast amount of patient study, careful selection of material and facts, and an orderly arrangement which makes the presentation of them doubly striking. The headings and sub-headings add to this effect.

The general problem of the patent medicine racket is first discussed, followed by statements of what might be and can be done. A chapter is devoted to " Disease and Its Treatment," which lays a foundation for which is said later on individual fake remedies. There is sound consideration of The Habit-Formers, Sleep-Producers, and Pain-Killers, pointing out their dangers. Under this heading, that gold mine, " Painful Menstruation," is duly treated of, and once again we are told of Mrs. Pinkham and her wonderful remedy. The danger of innocent women becoming drug fiends and alcoholics is stressed.

The rich field of diet fads is well handled, introduced by a scientific statement concerning diets and foods. Each subject is introduced with a statement of the facts known through careful study by scientists. For example, the chapter on reducing discusses the nature of obesity; that on infections, the nature of infection and immunity, before going on to tell of the frauds which are foisted on an entirely too willing public.

One of the most striking chapters is on cosmetics, though everyone knows of the tremendous business now being done in all sorts of beautifiers. There is a list of well known cosmetics given, with their selling price and the cost of manufacture. If we could only make the ladies believe what is so well known, they would go to reputable druggists and not buy highly advertised products. For example, one much advertised preparation which sells for $3.00, costs 39 cents, including the container; another which sells for $1.75, costs 9 cents, etc. " Today women spend something in the neighborhood of two billion dollars annually for something that cannot be purchased on the market—beauty."

The book contains far too many interesting and worth while facts for mention, and many striking points are made. In many countries, for example, only a thoroughly trained apothecary is allowed to dispense preparations which in this country are sold in grocery, department, and ten cent stores. " Proprietary " medicines, a name which fools many people including doc-

tors, are discussed. Out of a business in them of more than $172,000,000 in 1931, more than $52,000,000 was due to prescriptions by physicians. It is estimated that the American public spends $360,000,000 annually on patent medicine. One cannot but remember the witty statement of a Chinese Minister to the United States, who said: "You think the Chinese are uncivilized because they bind their women's feet. What about your women who bind their waists and your people who take such enormous quantities of patent medicines?"

The public should remember that it is paying millions and millions of dollars for advertising. Many of our otherwise reputable journals publish advertisements of the most arrant frauds. Newspapers are said to receive $700,000,000 per year, magazines $210,000,000, while mail advertising runs up to $400,000,000.

What was said concerning the selling price and cost of cosmetics is true of patent medicines. Laxatives and cathartics often contain Glauber's and Epsom salts. Certain widely advertised, so-called "mineral salts" sell for $1.50 a package and cost only 1½ cents to make; another sells for $1.00 and contains chemicals worth ⅔ cent. Of late, phenolphthalein, a coal-tar derivative, has become popular as a laxative and is sold under 50 different names. It sometimes produces very injurious results, yet is sold without any restrictions.

The author tells facts which should be known to everyone. The courts have defined the word drug as: "Some agency designed for the treatment of disease." Consequently, supposed remedies for physical defects do not come under the law. In the same way, in spite of the many poisonous ingredients in face lotions, hair dyes, etc., they have been exempt from the Food and Drugs Act. Any attempt to strengthen the law is fought vigorously by the manufacturers, one of whom even went so far as to complain that those enforcing the laws were "prejudiced in the interests of the public." Deserved tributes are paid to Dr. Harvey W. Wiley and to the Food and Drug Administration. Our laws consider the legal side rather than the scientific. We get more help in combating frauds from the Post Office Department, which denies the mails to frauds, than from others who would seem to be the ones chiefly concerned. In speaking of "Tanlac," which sold in 1922 for $2,000,000, the author says: "A monument commemorating public stupidity should have been erected with part of the proceeds."

At the close is an excellent chapter on "Medical Aid Till the Doctor Comes." An excellent bibliography and index is appended. Altogether, the book can be highly recommended and we wish for it a wide distribution. Unfortunately, it will be read too entirely by those who do not need it and too little by those who do need it. It is certainly one of the best expositions of this cold-blooded and often conscienceless traffic in health and life.

MAZŸCK P. RAVENEL

How the President, Thomas Jefferson, and Doctor Benjamin Waterhouse Established Vaccination as a Public Health Procedure —*By Robert H. Halsey, M.D. Published by the Author, New York,* 1936. 58 pp. Price, $1.00.

This is a valuable historical contribution to that ever interesting subject, vaccination against smallpox. We are told that the published letters of President Jefferson to Dr. Waterhouse can be readily found, but search at Charlottesville, Va., New York, Boston, Worcester, and New Haven failed to reveal any of the letters of Dr. Waterhouse to the President, or references to them. They

were finally located, with one exception, in the Library of Congress. The author has made them available to the general reader.

In addition to these letters, the pamphlet contains much valuable history, including a sketch of President Jefferson and his many activities, which incidentally brings in the names of a number of well known medical men and patriots of that era. There is a sketch of Dr. Waterhouse which gives us much of the history of the beginning of medical teaching in New England.

Perhaps most of us have never realized how much we owe to President Jefferson in the introduction of vaccine against smallpox. After failing to enlist active support from a number of influential people, Dr. Waterhouse appealed to President Jefferson, received at once "complete and enthusiastic accord," and within 24 hours, the President wrote the letter initiating the definite plan which aroused the interest of the profession and laity of Washington, Virginia, Philadelphia, and other places.

To Dr. Waterhouse is due, therefore, the credit of devising the method and inviting Jefferson to lend his influence in the execution of the procedure and thus expediting the introduction of vaccination as a preventive of smallpox and establishing it as a recognized public health measure.

The pamphlet is well printed and illustrated with reproductions of a miniature of President Jefferson, a portrait of Dr. Waterhouse, and the medical diploma issued to him by the University of Leyden, April 19, 1780. This pamphlet embodies a lecture given before the New York Academy of Medicine, March 14, 1934, and was published in 1936, but has just come to our hands. MAZÝCK P. RAVENEL

Fumigating Ships—The National Safety Council, 20 North Wacker Drive, Chicago, publishes a 6 page Industrial Safety Series Number, Mar. 1, giving the general background for ship fumigation, the nature of accidents caused by fumigation, precautions to be followed, the gases employed with particular mention of sulphur dioxide, carbon monoxide, hydrocyanic acid, and cyanide with chloro-picrin; also the use of gas masks and hose masks. The items compose 39 numbered paragraphs. There are 8 figures, some of them depicting safety instruction cards.

EMERY R. HAYHURST

Maternal Care — The Principles of Antepartum, Intrapartum and Postpartum Care for the Practitioner of Obstetrics—*Dr. F. L. Adair, Editor. Approved by the American Committee on Maternal Welfare, Inc. Prepared by Drs. W. C. Danforth, G. W. Kosmak, R. L. DeNormandie, F. L. Adair. Chicago: University of Chicago Press,* 1937. 93 pp. Price, Cloth, $1.00, Paper, $.25.

This booklet is a résumé of the pertinent problems which confront the family physician when he assumes the obligations of maternal care and offers guidance. It further serves to give him a measure for interpreting the adequacy of the service he is rendering to his maternal patients. One is impressed with the practical and conservative rationale of procedures and treatment which makes it possible for the family physician to give good obstetrical care for usual cases and point the way for care of emergencies for which we may seek the assistance of those more skilled in obstetrics.

For the public health nurse and the bedside nurse who render service to maternal cases the booklet outlines the basic principles of good maternal care in language which can be readily understood, giving specific and detailed instruction regarding prenatal instruction for the mother, preparation for de-

livery in the home, and postpartum care so that they can intelligently serve the attending physician and relieve him of some of the burden of details. They can also be better prepared to meet emergencies while waiting for the doctor and interpret danger signals which necessitate immediate medical consultation.

For the public health worker who must supervise programs of maternal care, this manual gives the basis for interpreting obstetric practice and maintaining standards in keeping with sound principles of adequate care. Many state health departments in coöperation with state medical societies are offering short courses in obstetrics for physicians who do not have close relationship with the large maternity services and whose practice is largely limited to home deliveries. The manual might well serve as an outline and summary of lectures and discussions for use in these courses.

Detailed information is given for history taking, physical examination, record keeping, and procedures in each phase of pregnancy—antepartum, intrapartum, and postpartum. One is amazed that one small volume can contain so much.

For those who question the relative value of prenatal care these authors point out that such care is absolutely essential for a considerable number of women if they are to avoid calamity, and unless routine, careful examination is made of all pregnant women it is impossible to determine which need care. Many studies of maternal mortality point to the responsibility of the physician and indicate that sane practices in obstetrics must be adhered to if maternal mortality rates are to be lowered. Studies of maternal care indicate that too often such practices are not carried out.

If a physician accepts pregnancy cases he must accept the entire responsibility. If the patients are unable to recompense him sufficiently for the many necessary services, and if he is unwilling to contribute his services, he should direct them to other sources where they may have the care that every pregnant woman needs.

In considering the argument that facilities for good care are not available and the trend in some localities is to insist on hospitalization for all pregnancy cases, the authors say that "good intrapartum or delivery care is possible without aseptic conveniences and other resources of a hospital. It is possible in normal cases to maintain the principles of surgical asepsis and give a woman good obstetric attention in the home." Fortunately the majority of cases are normal.

The problems of sepsis, the chief cause of maternal deaths, are well known. Perhaps it will be well to listen to those investigators who insist that so-called "autogenous" infections can eventually be traced to a definite point of entrance. Perhaps more emphasis on the use of a mask in the delivery room, without which the surgeon would never appear in the operating room, might reduce these "autogenous" infections.

The third great cause of maternal deaths is hemorrhage, usually an emergency which must be met as such. The value of immediate transfusion has been demonstrated beyond doubt. In the discussion of transfusions the authors are not quite clear. It is a moot question whether universal donors should be used except in emergency. The statement "Group IV is to be preferred" will probably be challenged by the pathologist, and unfortunately Group IV may refer to either the Jansky or the Moss classification. Undoubtedly Group IV Moss is meant or Group I Jansky or Group O International Classification.

Maternal mortality rates are much too high in the light of present knowl-

edge regarding the physiology of pregnancy and the mechanism of labor. The story of maternal morbidity has never been told. If it were told probably even greater emphasis would be given to prenatal and postpartum care.

If the principles outlined in this manual are followed by the practitioners we can hope for lowered maternal and infant mortality and morbidity rates, and to make child bearing relatively safe. Every physician who practises obstetrics might well study the manual most carefully, as well as nurses and public health workers.

MARTHA M. ELIOT

Proceedings of the Twenty-fourth Annual Meeting of the New Jersey Mosquito Extermination Association, Atlantic City, Mar. 17–19, 1937—*New Brunswick, N. J.*, 1937. 238 pp.

The *Proceedings* contains papers read before the annual meeting of the New Jersey Mosquito Extermination Association, one of the major meetings of mosquito control workers.

The papers present much practical information and considerable scientific data of interest to mosquito workers. Discussions of the papers are enlightening and afford an opportunity to learn of experiences elsewhere and of modifications of established mosquito control principles employed over a wide variety of sections. Mosquito control workers can ill afford not to peruse the present issue. Past copies should prove valuable as references.

An interesting topic presented is the protection from mosquitoes at outdoor meetings, an activity which would popularize any mosquito control campaign by affording temporary protection to outdoor public gatherings. Such protection would be especially valuable in demonstrating the desirability of mosquito-free environments.

A summary is given of work on mosquitoes throughout the world and should prove a boon to the busy worker who has little time to peruse the literature. Much contained in the summary is not available elsewhere, having been gathered direct by letter.

Valuable information is presented on directions for applying mosquito repellents for protection of outdoor gatherings; on the relation of mosquito prevalence to human comfort; the successful use of publicity in mosquito control campaigns; new and significant mosquito control developments in this country during 1936; the effect of rainfall on mosquito prevalence; studies of mass mosquito migration across open bodies of water; relation of mosquito control work to conservation activities, and other equally important subjects.

J. LYNNE ROBERTSON, JR.

Personal Hygiene—*By C. E. Turner. St. Louis: Mosby,* 1937. 335 pp. 3 color plates, 84 ill. Price, $2.25.

This book was prepared chiefly to give college students the basic health knowledge appropriate for the educated man and woman. It represents a revision, enlargement, and adaptation of Part I of the earlier book by this author on *Personal and Community Health.* Consideration is given to anatomy, physiology, and other underlying sciences to clarify and support the health teaching.

Introduced by a stimulating discussion of health values, the functions of the organs of the body are described in relation to such topics as nutrition, digestion, respiration, circulation, excretion, mental activity, reproduction, and exercise. Of the 20 chapters, the last 2 deal with responsibility for health maintenance, and with communicable diseases and immunity. The formation of proper health habits is stressed, but advice is lacking regarding such a problem as the selection of pasteurized

milk, more closely related to community health. The volume is well illustrated, and each chapter is followed by a list of references useful to the teacher or to the student who desires supplementary reading. This is a practical text, written in an interesting, not-too-technical, style, and well printed.

IRA V. HISCOCK

BOOKS RECEIVED

BIOLOGICAL LABORATORY TECHNIQUE: AN INTRODUCTION TO RESEARCH IN EMBRYOLOGY, CYTOLOGY AND HISTOLOGY. By J. Brontë, B.A., B.Sc., D.Phil.(Oxon.), M.A., Ph.D. (Dubl.), D.Sc.(Lond.). New York: Chemical Publishing Co. of New York, 1937. 130 pp. Price, $3.00.

BOARD MEMBERS' MANUAL: FOR BOARD AND COMMITTEE MEMBERS OF PUBLIC HEALTH NURSING SERVICES. Prepared by National Organization for Public Health Nursing. (New 2nd ed.) New York: Macmillan, 1937. 173 pp. Price, $1.50.

THE FAMILY IN HEALTH AND IN ILLNESS. By Florence Brown Sherbon. New York: McGraw-Hill, 1937. 516 pp. Price, $3.50.

A FIVE-YEAR STUDY OF TUBERCULOSIS AMONG NEGROES. New York: National Tuberculosis Association, 1937. Apply to State Agency.

GENERAL HYGIENE AND PREVENTIVE MEDICINE. By John Weinzirl. Philadelphia: Lea & Febiger, 1937. 424 pp. Price, $4.00.

HOME ECONOMICS SERIES:

Junior Home Problems (rev.).	310 pp.	$1.12.
Junior Foods (rev.).	362 pp.	1.16.
Junior Clothing (rev.).	264 pp.	1.16.

By Kate W. Kinyon and L. Thomas Hopkins. Boston: Sanborn, 1937.

AN INTRODUCTION TO SOCIAL STUDIES. By Joseph K. Hart. New York: Macmillan, 1937. 203 pp. Price, $2.00.

LABORATORY DIAGNOSIS OF SYPHILIS. By Harry Eagle. St. Louis: Mosby, 1937. 440 pp. Price, $5.00.

MATERNAL DEATHS: THE WAYS TO PREVENTION. By Iago Galdston. New York: *Commonwealth Fund, 1937. 115 pp.* Price, $.75.

NUTRITION. FINAL REPORT OF THE MIXED COMMITTEE OF THE LEAGUE OF NATIONS ON THE RELATION OF NUTRITION TO HEALTH, AGRICULTURE AND ECONOMIC POLICY. Geneva, Switzerland, 1937. International Documents Service, Columbia University Press, 2960 Broadway, New York. 327 pp. Price, $2.00.

NUTRITIVE ASPECTS OF CANNED FOODS. Compiled by Nutrition Laboratory, Research Department of the American Can Company, New York, N. Y., 1937.

ON BEING A BOARD MEMBER. Prepared by Robert G. Paterson, Ph.D. Committee on Administrative Practice. New York: National Tuberculosis Association, 1937. Apply to State Agency.

THE PNEUMONOKONIOSES (SILICOSIS): LITERATURE AND LAWS. Book III. By George G. Davis, Ella M. Salmonsen and Joseph L. Earlywine. Chicago: Chicago Medical Press, 1937. 1033 pp. Price, $10.00.

PRINCIPLES OF MEDICAL STATISTICS. By A. Bradford Hill, D.Sc., Ph.D. London: The Lancet Limited, 1937. 171 pp. Price, $2.25.

PROCEEDINGS OF THE 1936 ANNUAL CONFERENCE OF THE NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS. Publication No. 245. New York: National Society for the Prevention of Blindness, 1937. Price, $1.00.

SAFETY PROGRAMS AND ACTIVITIES. By Florence S. Hyde and Ruth C. Slown. (rev. ed.) Chicago: Beckley-Cardy, 1935. 267 pp. Price, $1.25.

SAFETY THROUGH THE YEAR: AN ACTIVITY-TEXT-WORKBOOK—FOR UPPER GRADES. By Florence Nelson, Olis G. Jamison and Raymond E. Sparks. New York: McGraw-Hill, 1937. 128 pp. Price, $.48.

SOME FUNDAMENTAL ASPECTS OF THE CANCER PROBLEM. *Edited by Henry Baldwin* Ward. New York: Science Press, 1937. 248 pp. Price, $2.50.

THE SUBNORMAL MIND. By Cyril Burt, M.A., D.Sc.(Oxon.). (2nd ed.) London: Oxford University Press, Humphrey Milford, 1937. 372 pp. Price, $5.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Health Education for All—Urging a national program and national organization for promoting health education, the author points to the weaknesses of the present lack of a coördinated plan.

BOUSFIELD, M. O. The Negro Home and the Health Education Program. J. Negro Ed., July, 1937, p. 513.

New York's Venereal Patients—How a third of a million treatments for venereal disease per year are carried out, and how the corresponding epidemiologic and educational measures are conducted is reported in this account of the activities of the social hygiene bureau of the New York City Department of Health.

CLARKE, C. W. The New York City Plan for Combatting Venereal Diseases. J.A.M.A. 109, 13:1021 (Sept. 25), 1937.

About School Child Health—In a symposium on health problems in education, these questions were raised: Should the public schools which have only a part of all children for only a quarter of the day for only half the days in the year operate a health service, a police, or a social service? Since the family, the school, and the private physicians can assume only part of the total health responsibility, how much remains for public health? How far can the school go in improving nutrition of children and the community? Among other subjects, vision and hearing are brought into the discussion.

FERRELL, J. A. Control of Communicable Diseases in Schools.

MCLESTER, J. S. Nutrition Problems in Education.

NEWHART, H. Hearing Problems in Education.

JACKSON, E. Light in the Schoolroom.

ROGERS, J. F. Health Education and Health Services in Schools. J.A.M.A. 109, 11:835 (Sept. 11), 1937.

Not What to Think, But How—Contrasts in parallel columns, of the old approach and the newer methods of promoting school child health in rural schools.

HARRIS, R. F. New Ways for Old in Rural School Health. Pub. Health Nurs. 29, 9:506 (Sept.), 1937.

How to Raise Mosquitoes—Of use to very few sanitarians, these detailed instructions are here included chiefly because they contain so much that is new, at least to this reviewer.

JOHNSON, H. A. Notes on the Continuous Rearing of *Aedes Aegypti* in the Laboratory. Pub. Health Rep. 52, 35:1177 (Aug. 27), 1937.

Health Services versus Health Needs—Picturing the inadequacy of rural health services in a southern community, the survey points a lesson which is, no doubt, applicable the country over.

MOUNTIN, J. W., *et al.* Relationship of a Rural Health Program to the Needs in the Area. Pub. Health Rep. 52, 37:1264 (Sept. 10), 1937.

Infantile Paralysis Measures—In this Canadian symposium on poliomyelitis the discussions have to do with the statistics of the recent epidemic, the nature of the virus infection, the epidemiology and symptomatology of the disease, nasal spraying as

a prophylactic, and convalescent serum in treatment.

PHAIR, J. T., *et al.* Symposium on Anterior Poliomyelitis. Canad. Pub. Health J. 28, 9:417 (Sept.), 1937.

Selling British Public Health—One hundred English mothers were asked what the medical officer of health was: 65 had an idea more or less vague (mostly more) and 35 had no idea whatever. So a campaign was inaugurated to tell England what health services were offered and how the public might use them. The details are interesting.

RANKINE, P. S. The National Campaign to Encourage a Wider Use of Health Services. Pub. Health. 50, 12:371 (Sept.), 1937.

As Others See Us—Commendation of the Appraisal Form as an instrument for increasing the efficiency of health administration is doubly welcome, coming from one not identified with public health and appearing in the lay press.

RIDLEY, C. E., and HERBERT, A. S. Measuring Public Health Work. Public Management. 29, 9:270 (Sept.), 1937.

Breaking New Ground with Prontosil—Experimental studies are reported in which prontosil is shown to be therapeutically active against one virus disease. Newer derivatives were inferior.

ROSENTHAL, S. M., *et al.* The Chemotherapy of Choriomeningitis Virus Infection in Mice with Sulphonamide Compounds. Pub. Health Rep. 52, 36:1211 (Sept. 3), 1937.

Reporting Progress — Bird's-eye view of health education in the classroom here and abroad. On the whole, the prospect is encouraging.

TURNER, C. E. Present Trends in Health Education. Pub. Health Nurs. 29, 9:499 (Sept.), 1937.

About Detroit's Tuberculosis Problem — Tuberculosis control requires the discovery of the minimal case and the isolation of the infectious case. This necessitates money, of which there is so little, though plenty is spent for custodial care. Detroit was able to sell the preventive program to the city administration. What happened is interestingly told.

VAUGHAN, H. F., and DOUGLAS, B. H. Intensive Case Finding Work in Tuberculosis. J.A.M.A. 109, 10:771 (Sept. 4), 1937.

ASSOCIATION NEWS

OFFICERS, 1937–1938

President, ARTHUR T. MCCORMACK, M.D., Louisville, Ky.
President-elect, ABEL WOLMAN, DR.ENG., Baltimore, Md.
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THE NEXT ANNUAL MEETING WILL BE HELD IN KANSAS CITY, MO.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Charles A. Akin, M.D., U. S. Quarantine Station, Rosebank, S. I., N. Y., Chief Quarantine Officer

Jose Angulo Araico, M.D., Praga # 22, Mexico City, Mex., Health Officer, Mobile Unit, Jalisco Coördinated Public Health Services

Mariano Barragan, M.D., Belem # 371, Guadalajara City, Jal., Mex., State Health Officer

A. C. Baxter, M.D., State Dept. of Public Health, Springfield, Ill., Assistant Director

Oscar A. Berlanga, M.D., Ramon Guzman # 12, Mexico City, Mex., Assistant City Health Officer

Welby W. Bigelow, M.D., C.P.H., 124 State Capitol Bldg., Salt Lake City, Utah, Deputy State Health Officer, District # 1

Earl P. Bowerman, M.D., Gibson County Health Dept., Trenton, Tenn., Assistant Health Officer

Robert H. Broad, M.D., 101 N. Cayuga St., Ithaca, N. Y., Health Officer

Hubert F. Carroll, M.D., Indian Lake, N. Y., Health Officer

Dr. Eduardo Castro Garduno, Cauauhtematzin # 238, Mexico City, Mex., Health Officer

David Cooper, D.D.S., U. S. Public Health Service, Washington, D. C., Passed Assistant Dental Surgeon

Aubrey Y. Covington, M.D., Morganfield, Ky., Director, Union County Health Dept.

Joseph Dillenberg, M.D., 3599 Bainbridge Ave., Bronx, N. Y., Medical Officer in charge of Westchester-Pelham Health Centre, New York City Health Dept.

Morris Dreyfuss, M.D., 456 E. Church St., Elmira, N. Y., Health Officer of Big Flats

James A. Dumas, M.D., Health Department, Lynn, Mass., Health Commissioner

R. Clifford Errickson, City Hall, Long Branch, N. J., Health Officer

Thomas E. Eyres, M.D., 1417–43 St., Des Moines, Ia., Medical Director of Polk County

John W. Ferree, M.D., 102 N. Senate Ave., Indianapolis, Ind., Chief, Bureau of Local Health Administration, State Board of Health

Robert W. Fowler, M.D., 11802–84 Ave.,

Richmond Hill, L. I., N. Y., Medical Officer in charge of Health District, New York City Dept. of Health

Clarence L. Gannon, M.D., 77 Green St., Kingston, N. Y., State District Health Officer

A. Floyd Gardner, M.D., C.P.H., 26 Fordonia Bldg., Reno, Nev., Director, Local Health Administration, State Board of Health

Dr. Jose Eduardo Gonzalez, 2a Culiacan # 26, Mexico City, Mex., Quarantine Health Officer

Ernest E. Huber, M.D., C.P.H., State Dept. of Health, Columbus, O., Surgeon, U. S. Public Health Service, Chief of Preventive Medicine

Salvador Iturbide Alvirez, M.D., Ave. Coyoacan # 412, Mexico City, Mex., Chief Clerk, Federal Department of Health

U. S. Lewis, M.D., East Dubuque, Ill., District Health Supt., State Dept. of Public Health

George E. Martin, M.D., Leech Farm Hospital, Pittsburgh, Pa., Superintendent, Tuberculosis Hospital, Dept. of Public Health

Bernard McBride, M.D., 128 Newport Rd., Island Park, N. Y., Health Officer

Morris L. Ogan, M.D., 148–15 Archer Ave., Jamaica, N. Y., Medical Officer in Charge of Jamaica East and West District, New York City Dept. of Health

Jesus Olmos, M.D., Ave. Independencia # 1410, Chihuahua, Chih., Mex., President, Health Dept.

James A. Olson, M.D., Oak Grove School Clinic, Flint, Mich., Medical Director, Board of Education

Mario L. Palmieri, M.D., M.P.H., 43 S. Main St., Middletown, Conn., Health Officer

George S. T. Peeples, M.D., Georgetown, S. C., Director, Georgetown-Williamsburg County Health Dept.

Silvestre Lopez Portillo, M.D., 55 Shattuck St., Boston, Mass., Public Health Officer, Federal Health Dept. in Mexico

Dr. Alfonso Priani, Ave. Condesa 605, Mexico City, Mex., Executive Secretary General, J'ed

Laura M. Riegelman, M.D., 271 Rutland Rd., Brooklyn, N. Y., Health Officer, Flatbush and Lower Flatbush District, New York City Health Dept.

Caspar de la Garza Saldivar, M.D., Oficina Central Servicios Sanitarios Coordinados, Pachuca City, Mex., State Health Officer of Hidalgo

Walter S. Stevens, M.D., Rm. 315, P. O. Bldg., Oklahoma City, Okla., District Medical Director, U. S. Indian Service

Richard M. Street, M.D., Laurens County Health Dept., Laurens, S. C., County Health Director

Charles K. Tomlinson, M.D., 36 Church St., Amsterdam, N. Y., State District Health Officer

Alberto Vargas, M.D., Ave. Jaurez # 62, Oaxaca City, Oax., Mex., State Health Officer

Dr. Luis Vasquez Campos, Oficina Central Servicios Sanitarios Coordinados, Tapachula, Chiap., Mexico, State Health Officer

Laboratory Section

Luis Benitez Soto, M.D., Artes # 153, Mexico, D. F., Mex., Medico Subausciliar de la Oficina de Epidemiologia

Donald C. A. Butts, Sc.D., St. Luke's and Children's Hospital, Philadelphia, Pa., Director, Laboratory of Experimental Immunology

Karl G. Frank, Ph.D., New York Museum of Science and Industry, 30 Rockefeller Plaza, New York, N. Y., Educational Work

William H. Headlee, Ph.D., National Pedagogic Institute, Ministry of Education, Caracas, Venezuela, S. A., Head, Dept. of Biology

A. Clayton Most, 17 S. Wilson Blvd., Mt. Clemens, Mich., Bacteriologist, Macomb County Laboratory

Morris A. Nussbaum, 211 W. 70 St., New York, N. Y., Assistant in Laboratory Course, Columbia School of Public Health

Florence P. Roebling, Valley Health District, Luray, Va., Director of Laboratory

Dr. Reinaldo Sancedo y Andrade, Calle Hidalgo 407, Tepic Nay, Mex., Jefe de Servicios Sanitarios en Nayarit

Louis Siegel, 1950 Andrews Ave., Bronx, N. Y., Bacteriologist, Antoxgen Inc.

Annabel W. Walter, 40 Monroe St., New York, N. Y., Bacteriologist, Bureau of Laboratories, Dept. of Health

Vital Statistics Section

Morris G. Caldwell, Ph.D., Frazee Hall, Lexington, Ky., Assistant Professor of Sociology, University of Kentucky

Henry J. Klein, 1 Madison Ave., New York, N. Y., Statistical Bureau, Metropolitan Life Ins. Co.

Mehmet K. Olcar, M.D., C.P.H., 615 N. Wolfe St., Baltimore, Md., Associate Professor of Vital Statistics and Epidemiology, School of Hygiene and Public Health

Emma G. Pregnall, 217 Calhoun St., Charleston, S. C., Chief Clerk, Health Dept.

Public Health Engineering Section

Albert N. Aeryns, C.E., 716 Greenwood Ave., Brooklyn, N. Y., Sanitary Engineer, New York City Health Dept.

Seth G. Hess, C.E., 60 Hudson St., New York, N. Y., Chief Engineer, Interstate Sanitation Commission

Ralph E. Hughes, 122 Garland St., Everett, Wash., Laboratory Assistant, Health Dept.

John H. Miller, Madison, W. Va., Sanitary Engineer, Boone County Health Dept.

Charles H. Niggeman, Manistique, Mich., Sanitary Engineer, Alger-Schoolcroft Health Dept.

Industrial Hygiene Section

Paul J. Houser, State Dept. of Health, Des Moines, Ia., Industrial Hygiene Engineer

William B. Long, M.D., 830 Park Ave., New York, N. Y., Director and Chairman, Social Hygiene Committee, New York Tuberculosis and Health Assn.

Leo Tobias, M.D., 326 E. 52 St., New York, N. Y., Charge of Industrial Inspections, Dept. of Health

Food and Nutrition Section

Wade F. Alexander, 66 James St., Schenectady, N. Y., Milk Sanitarian, State Dept. of Health

Dr. Rogelio Arenas Martorell, Concordia 20, Habana, Cuba, Veterinarian, Junta Nacional de Sanidad

Miriam F. Clarke, Ph.D., 1 Beech Tree Lane, Bronxville, N. Y., Biochemist, Nutrition Research Laboratory, Burroughs Wellcome and Co.

Robert L. Cline, 41–12–66 St., Woodside, L. I., N. Y., Milk Inspector, Dept. of Health

Robert E. Corradini, 393 Woodland Rd., Madison, N. J., Executive Secretary, Foundation for Narcotics Research and Information, Inc.

Irving Dubinsky, 607 Hopkinson Ave., Brooklyn, N. Y., Inspector of Foods, Dept. of Health

John Eisen, 32 Bough 2 Place, Brighton Beach, Brooklyn, N. Y., Supervising Inspector of Foods, Dept. of Health

Daniel J. Ferris, 413 E. 156 St., Bronx, N. Y., Inspector of Foods, Dept. of Health

Paul F. Gilberty, 99–21 Northern Blvd., Queens, N. Y., Inspector of Foods, Dept. of Health

Charles F. Gilman, 19 Herkimer St., Brooklyn, N. Y., Supervisor, City Milk Division, Dept. of Health

Jacob D. Glaubach, M.D., 540 W. 136 St., New York, N. Y., Inspector of Foods, Dept. of Health

Morris Goldberg, 2219–64 St., Brooklyn, N. Y., Inspector of Foods, Dept. of Health

Joseph Goldstein, 1970 E. 18 St., Brooklyn, N. Y., Milk Inspector, Dept. of Health

Maurice Goldstein, 1702 Clay Ave., Bronx, N. Y., Inspector of Foods, Dept. of Health

Harry E. Goresline, Ph.D., 726 Richmond Ave., Silver Spring, Md., Senior Bacteriologist, Bureau of Chemistry and Soils, U. S. Dept. of Agriculture, Washington, D. C.

Jack Z. Greenberg, 652 Willoughby Ave., Brooklyn, N. Y., Inspector of Foods, Dept. of Health

Harvey Grossman, 723 E. 27 St., Brooklyn, N. Y., Inspector of Foods, Dept. of Health

Edward Heiss, 302 E. 18 St., New York, N. Y., Inspector of Foods, Dept. of Health

Alexander W. Johnson, 134–32–229 St., Laurelton, N. Y., Inspector of Foods, Dept. of Health

John P. Kelaher, 3050 Bainbridge Ave., New York, N. Y., Inspector of Foods, Dept. of Health

Hyatt Kisselbrack, Kings Court Hotel, Poughkeepsie, N. Y., Chief Supervising County Milk Inspector, Dept. of Health

Irving Kleeman, 1730 Carroll St., Brooklyn, N. Y., Inspector of Foods, Dept. of Health

Walter H. Knudsen, 9232–245 St., Bellerose, N. Y., Inspector of Foods, Dept. of Health

Elias Kushell, 984 Schenectady Ave., Brooklyn, N. Y., Chief Supervising Inspector, Borough of Brooklyn, Dept. of Health

Paul Laude, 64–30–79 St., Middle Village, N. Y., Food Inspector, Dept. of Health

Andrew Lippman, 904 Albany Ave., Brooklyn, N. Y., Food Inspector, Dept. of Health

James J. McKiernan, 4326 Edson Ave., Bronx, N. Y., Sanitary Inspector, Dept. of Health

Herman Miller, 511 Commonwealth Ave., Bronx, N. Y., Inspector of Foods, Dept. of Health

Frank J. O'Hare, 2869 Coddington Ave., New York, N. Y., Inspector of Foods, Dept. of Health

Charles R. Pope, 2116 Ditmas Ave., Brooklyn, N. Y., Inspector of Foods, Dept. of Health

James C. Ridley, 250 Carnation Ave., Floral Park, N. Y., Supervising Inspector, Borough Chief, Dept. of Health

Freeman M. Scales, 179 Central Parkway, Mt. Vernon, N. Y., Director of Laboratory, Sheffield Farms Co.

Harry Sondak, 1171 Sherman Ave., Bronx, N. Y., Inspector of Foods, Dept. of Health

Daniel Stein, 2845 W. 30 St., Brooklyn, N. Y., Inspector of Foods, Dept. of Health

Lewis W. Waters, 250 Park Ave., New York, N. Y., Vice-President, General Foods Corp.

Rafael Velez Mucino, M.D., 3a Rio de la Loza # 86, Mexico City, Mex., Chief of Mobile Units, Central Office of Rural Health

C. W. Weber, 65 Court St., Buffalo, N. Y., Senior Sanitarian, State Dept. of Health

Albert Weinberg, 274 W. 96 St., New York, N. Y., Inspector of Foods, Dept. of Health

Harry Winikoff, 2020 Grand Ave., New York, N. Y., Inspector of Foods, Dept. of Health

Victor S. Wittman, 5864–78 Ave., Evergreen, L. I., N. Y., Inspector of Foods, Dept. of Health

Lewis Radcliffe, Sc.D., 5600–32 St., Washington, D. C., Director, Oyster Institute of North America

Child Hygiene Section

George M. Anderson, D.D.S., 831 Park Ave., Baltimore, Md., Dental Member, State Board of Health

Mary Arnold, 125 Worth St., New York, N. Y., Organization Secretary, Committee on Neighborhood Health Development, Dept. of Health

Henry L. Bibby, M.D., 212 Fair St., Kingston, N. Y., Health Officer of Olive

Harold Burg, M.D., 1631 Walton Ave., New York, N. Y., District Medical Supervisor, Dept. of Health

Manuel Canseco Landero, M.D., Armenta y Lopez # 10, Oaxaca City, Mexico, Chief, Child Health Division

Marjorie L. Craig, Metropolitan Life Ins. Co., New York, N. Y., Correspondent, School Health Bureau

Percy F. Gray, M.D., Smith Tower, Seattle, Wash., Chief, Maternal and Child Hygiene Division, State Dept. of Health

Herman E. Hilleboe, 1869 Sargent St., St. Paul, Minn., Director, Division of Tuberculosis and Services for Crippled Children, State Board of Control

Josephine M. Hooley, 110 Municipal Bldg., Elkhart, Ind., Supervisor, Elkhart Child Welfare

Isabel H. McClinton, M.D., Albion State Training School, Albion, N. Y.

Elwood S. Morton, M.D., 891 E. 21 St., Brooklyn, N. Y., Director, Bureau of School Hygiene, Dept. of Health

Martha A. O'Malley, M.D., 461 Prospect Ave., West Hartford, Conn., Physician, Bureau of Child Hygiene, State Dept. of Health

Susan P. Souther, M.D., State Office Bldg., Hartford, Conn., Medical Officer, Bureau of Child Hygiene, State Dept. of Health

William Thau, M.D., 11 Tetlow St., Boston, Mass., Student at present

Public Health Education Section

Alfred M. Clayton, 210 Riverway, Boston, Mass., Training for Dental Health Officer, Missouri State Board of Health

Walter F. Cobb, M.D., C.P.H., 853 Riverside Drive, New York, N. Y., Medical Examiner and Instructor in Hygiene, College of the City of New York

Edward P. Ehrich, 617–19 St., N. W., Washington, D. C., Public Relations, Press and Information Assistant to the Surgeon General, U. S. Public Health Service

David E. Ehrlich, M.D., 35 W. 92 St., New York, N. Y., Instructor in Tuberculosis, Dept. of Health

Wilfred H. Emery, M.D., Union College, Lincoln, Nebr., School Physician

Alice Evans, 660 Frederick St., Detroit, Mich., Director, Health Education Service, Children's Fund of Michigan

Ralph T. Fisher, 25 E. Blackwell St., Dover, N. J., Sanitary Inspector, State Dept. of Health

Ronald B. Fox, D.D.S., Michigan Dept. of Health, Lansing, Mich., Assistant, Bureau of Mouth Hygiene

Norman R. Goldsmith, M.D., 5802 Beacon St., Pittsburgh, Pa., Writer of Scientific Articles

Lois S. Goodwin, 103 Valley Drive, Syracuse, N. Y., Chairman, Public Health Committee of New York State Federation of Home Bureaus

Ethel M. Hendrikson, Hague, N. Y., Instructor in Public Health Education, State Dept. of Health

Florence B. Hopkins, M.D., 1 Beacon St., Boston, Mass., Consultant in Dental Hygiene, Division of Child Hygiene, State Dept. of Health

Ross Huston, M.D., 1004 Liberty Bldg., Des Moines, Ia., Vice-President and Medical Director, Bankers Life Co.

John B. Kelly, State Reconstruction Home, West Haverstraw, N. Y., Superintendent

Alice C. Kemp, 98 Suffolk St., Holyoke, Mass., Executive Secretary, Holyoke Tuberculosis Assn.

Charles E. Lyght, M.D., Carleton College, Northfield, Minn., Director, Student Health Service

Dr. Lauro Ortega, Privada del Roble # 3, Mexico City, Mex., Chief, School Health Division

Elna I. Perkins, 1148 Little Bldg., Boston, Mass., Education Secretary, Massachusetts Tuberculosis League

Samuel Plotkin, 1490 Crotona Park East, Bronx, N. Y., Inspector of Foods, Dept. of Health

Lillian M. Richards, 323 W. 138 St., New York, N. Y., Executive Secretary, Harlem Tuberculosis and Health Commission

Robert V. Schultz, M.D., 310 Cedar St., New Haven, Conn., Student

John C. Sharp, M.D., Monterey County Hospital, Salinas, Calif., Medical and Health Director

Cynthia P. Sweet, R.N., 18 Cannon St., Poughkeepsie, N. Y., Executive Secretary, Dutchess County Health Assn.

Dr. Mario Villamil Mendoza, Calle 47 # 468, Merida, Yucatan, Mex., Delegado Sanitario Federal en Yucatan del Dept. Salubridad

Elsa Volckmann, 45 Carteret St., Bloomfield, N. J., Senior Correspondent, Welfare Division Social Agencies, Metropolitan Life Ins. Co.

Public Health Nursing Section

Theresa R. Anderson, 256 Water St., Augusta, Me., Staff Executive and Nurse Supervisor, Maine Public Health Assn.

Catherine Corley, 2411 N. Charles St., Baltimore, Md., State Nurse Instructor, State Dept. of Health

Helen W. Coryell, Cayuga Heights Rd., Ithaca, N. Y., Consultant Nurse, Div. of Tuberculosis, State Dept. of Health

Kittee M. G. Cosandier, 801 S. 32 St., Lincoln, Nebr., Field Nurse, Lincoln and Lancaster County Tuberculosis Assn.

Theresa DeJong, White Cloud, Mich., County Nurse, District Health Unit # 5

Florence A. Dierberg, R.N., Greve Coeur, Mo., Educational Director, Visiting Nurse Assn.

M. Evelyn Donnelly, 2 Tremont Ave., Binghamton, N. Y., District Supervising Nurse, State Dept. of Health

Viola C. Drake, 644 Ridge Rd., W., Rochester, N. Y., Orthopedic Nurse, State Dept. of Health

Ruth E. George, 421 P. O. Bldg., Lincoln, Nebr., Director, Nursing Service, Lincoln and Lancaster Chapter, American Red Cross

Ruth A. Heintzelman, Landover, Md., Public Health Nursing Consultant, U. S. Children's Bureau

Ella M. Hott, 806 Jackson, Jefferson City, Mo., Consultant, Public Health Nursing Education, State Board of Health

Anna T. Hudson, 218 Euclid Ave., Albany, N. Y., District Supervising Nurse, State Dept. of Health

Dr. Emilia Leija Paz de Ortiz, Nayarit 38, Mexico, D. F., Mex., Medica Auxiliar, Jefe de la Oficina Central de Enfermeras del Dept. de Salubridad Publica

Margaret Lewis, R.N., 138 Washington St., Middletown, Conn., Supervising Public Health Nurse, State Dept. of Health

Mildred McMillan, R. 3, Box 180, Independence, Mo., State Supervisor of Midwifery

Ruth M. Olson, R.N., 74 S. Burritt St., New Britain, Conn., Principal Supervising Public Health Nurse, Bureau of Child Hygiene, State Dept. of Health

Katherine T. Orbison, 50 Weyman Ave., New Rochelle, N. Y., Director, New Rochelle V.N.A.

Margaret D. Seeds, R.N., 539 N. Wolfe St., Baltimore, Md., Special Tuberculosis Worker, Eastern Health District

Emily M. Smith, Andrew Jackson Tavern, Jonesboro, Tenn., Public Health Nurse, Washington County Health Dept.

Jane B. Taylor, 703 Harrison St., Topeka, Kans., Special Nurse, City Health Dept.

Sarah E. VanVranken, 593 Park Ave., Rochester, N. Y., Assistant District State Supervising Nurse, State Dept. of Health

Epidemiology Section

Justin M. Andrews, Sc.D., 615 N. Wolfe St., Baltimore, Md., Associate Professor of Protozoölogy, Johns Hopkins School of Hygiene and Public Health

Miguel Barriga Lomeli, M.D., Merida 130, Dept. H, Mexico City, Mex., Assistant Epidemiologist, Federal Dept. of Health

Eugene W. Bogardus, M.D., C.P.H., 10 Sterling Ave., White Plains, N. Y., Director, Division of Tuberculosis, Westchester County Dept. of Health

F. M. Boldridge, M.D., Duke Power Co., Charlotte, N. C., Health Officer

Antonio Candano, M.D., C.P.H., Acapulco # 8, Mexico, D. F., Mex., Epidemiologist, Central Office of Rural Hygiene, Dept. of Public Health

O. N. Cone, M.D., State Board of Health, Jacksonville, Fla., Epidemiologist

Max Danziger, D.V.M., 1661 E. 19 St., Brooklyn, N. Y., Chief Veterinarian, Bureau of Preventable Diseases, Dept. of Health

Dr. Juan Enriquez de la Fuente, Centro de Higiene Rural, Minatitlan, Ver., Mexico, Epidemiologist, Charge of Tuberculosis Work

Alexander G. Gilliam, M.D., Dr.P.H., National Institute of Health, Washington, D. C., Passed Assistant Surgeon, U. S. Public Health Service

Fred W. Graves, V.M.D., 21 Cleveland, Albany, N. Y., Senior Milk Sanitarian, State Dept. of Health

John B. Horner, M.D., 28 Eagle St., Albany, N. Y., Charge of Outpatient Dept., on G. U. Service, Memorial Hospital

William M. McKay, M.D., State Capitol, Salt Lake City, Utah, Epidemiologist and Director of Communicable Disease Control, State Board of Health

Robert E. Plunkett, M.D., State Dept. of Health, Albany, N. Y., General Supt. of Tuberculosis Hospitals

Gertrude A. Stott, 119 Washington Pl., New York, N. Y., Nurse Epidemiologist, State Dept. of Health

Unaffiliated

Perry A. Anderson, M.D., 427 E. State St., Rockford, Ill., Medical Director, Rockford Life Ins. Company

Guy J. Bartle, Montgomery, N. Y., Inspector, New York City Dept. of Health

Fred R. Brigham, 718 Main St., Fitchburg, Mass., Agent, Board of Health

F. Stuart Chapin, Ph.D., 2 Melbourne Ave. S. E., Minneapolis, Minn., Hygiene of Housing

Donald G. Davy, M.D., C.P.H., 1407 Montgomery, San Francisco, Calif., State Medical Director—State Relief Admr.

Dr. Roberto del Valle, 1203 Pino Suarez, N. Laredo, Tams, Mex., Delegado Sanitario Federal

Roderick Heffron, M.D., 41 E. 57 St., New York, N. Y., Medical Associate, Commonwealth Fund

Carlos Ortiz Mariotti, M.D., Monterrey 350, Mexico City, Mex., Inspector General, Federal Dept. of Health

Leonard A. Scheele, M.D., 8742 Elmhurst Ave., Elmhurst, L. I., N. Y., Passed Assistant Surgeon, U. S. Public Health Service

Loren W. Shaffer, M.D., 1368 Yorkshire Rd., Detroit, Mich., Director, Social Hygiene Division, Detroit Dept. of Health

Paul Wakefield, M.D., 75 Richardson Rd., Belmont, Mass., Supervisor, Crippled Children's Clinics

Dorothy V. Weston, Weston's Mills, N. Y., Member, New York State Charities Aid Society, Executive Committee on Tuberculosis and Public Health

Carolyn Wormser, 135 Wyckoff Place, Woodmere, N. Y., Student

DECEASED MEMBERS

Charles A. Bentz, M.D., Buffalo, N. Y., Elected Member 1916, Fellow 1923

David H. Bergey, M.D., D.P.H., Philadelphia, Pa., Elected Member 1915, Fellow 1922

H. O. Jones, M.D., Chicago, Ill., Elected Member 1917, Fellow 1928

Harvey D. Brown, Ph.D., Philadelphia, Pa., Elected Member 1924

Charles E. Carrigan, Niagara Falls, N. Y., Elected Member 1927

Mary A. Devlin, R.N., Rutland, Vt., Elected Member 1920

Geoffrey Morris, M.D., Globe, Ariz., Elected Member 1931

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge. Public health nurses are registered with the Joint Vocational Service, 122 E. 22 Street, New York, N. Y., with which the Association coöperates.

Replies to these advertisements, indicating clearly the key number on the envelope, should be addressed to the American Public Health Association, 50 W. 50 Street, New York, N. Y.

POSITIONS AVAILABLE

MUNICIPAL CIVIL SERVICE COMMISSION
NEW YORK CITY

Assistant Director (Bureau of Laboratories). Open to residents of New York State. Men and women, M.D. or degree in Bacteriology requisite; five years' experience in laboratory of recognized standing. Vacancies: two. Ages: 30–50 preferred. Salary $4,500.

Assistant Director (Pneumonia Control). Open to qualified U. S. citizens, men or women. M.D. degree with eligibility for license in New York State requisite. Five years' experience in clinical and laboratory aspects of pneumonia control, with special emphasis on serum therapy. Vacancies: one. Ages 30–45 preferred. Salary $6,000.

Applications close November 10, 1937. Address the Commission at Municipal Building, New York, N. Y.

WANTED:

(a) Public health physician; rural district, southern state; special training provided, $3,600–$4,800.

(b) Public health nurse to carry on prenatal nursing program; midwest.

(c) Woman physician; full-time appointment; public schools; East.

(d) Public health man experienced in teaching to head department of preventive medicine; class A school.

(e) Public health nurse for community nursing among Chinese children; Southern California.

(f) Bacteriologist and serologist; state public health laboratory; $1,800–$2,400.

Address # 26-PH, Medical Bureau, Pittsfield Building, Chicago, Ill.

POSITIONS WANTED

HEALTH OFFICERS

Experienced Health Officer who has completed Vanderbilt short course, 1936, will consider appointment. West preferred. A320

Physician, age 30; graduate of Indiana University; C.P.H., Johns Hopkins; available for full-time county health work or epidemiology. A340

Physician, graduate of Columbia P. & S., with teaching and administrative experience in pediatrics, will consider administrative position in child hygiene. A341

Physician, age 33; M.D., University of Wisconsin; M.P.H., Harvard; specializing in industrial hygiene, will also consider general administration. A342

Physician, age 37, experienced in health administration of cities and states, will consider attractive opening in maternal and child health or health education. A343

Physician, age 48, present full-time county health officer with special interest in venereal disease control, will consider attractive opening. A344

Physician, M.B., Ohio State University; C.P.H., Harvard; with special interest in industrial hygiene, will consider position as epidemiologist and health officer. A345

Physician, M.D., University of Maryland; C.P.H., Johns Hopkins; broad experience in county public health administration, will consider opening of better class. A346

CHILD HYGIENE

Woman physician, M.D., Rush Medical, wishes administrative or clinical position in maternal and child health. C347

Woman physician, M.D., Yale; Dr.P.H., Yale; experienced in pediatrics and administration of state bureau, will consider attractive opening. C348

LABORATORY

Gentleman, Ph.D., University of Southern California; special courses at Pasteur Institute, Paris, wishes position as director of a laboratory, in research work or in field investigation. Has had wide experience as instructor in bacteriology in a State University, director of a state hygienic laboratory, director of several hospital laboratories, and research assistant, department of bacteriology in a western university. L315

STATISTICIAN

Young man with 8 years' experience in public health statistics in well known national organization, and degree in Business Administration, now employed, will consider statistical position or combination with office administration. A310

MISCELLANEOUS

Woman, with excellent preparation and wide experience in health education field; Organization, administration, supervision and program-making in city, rural and state work. Now employed but would consider good opportunity. $3,500 minimum. M316

NEWS FROM THE FIELD

MASSACHUSETTS DUST AND FUME CODE COMMITTEE

COMMISSIONER James T. Moriarty, of the Massachusetts Department of Labor and Industries, has appointed the following committee to assist the Department in the preparation of rules and regulations for the control of hazardous dusts and fumes in the manufacturing establishments of the states:

Joseph C. Aub, M.D.,† of the Collis P. Huntington Memorial Hospital; Associate Professor of Medicine, Harvard Medical School, Boston, Mass.

E. H. Ballard, General Foundry Superintendent, General Electric Company

John Daniels, Legislative Agent, Associated Industries of Massachusetts

Philip Drinker, B.S.,† Professor of Industrial Hygiene, Harvard University School of Public Health, Boston, Mass.

Laurence Foley, International President, Granite Cutters International Association of America

Francis T. Hunter, M.D., of the Massachusetts General Hospital

William M. Rand, President, Merrimac Chemical Company

Robert J. Watt, Secretary-Treasurer, Massachusetts Federation of Labor

Stephen E. Whiting,† Chief Engineer, Liberty Mutual Insurance Company, Boston, Mass.

In the field of industrial dust control, the current undertaking is a sequel to the investigation and report of the Massachusetts Special Industrial Disease Commission of 1933–1934 and the findings of the Granite Dust Control Project conducted by the Department's Division of Occupational Hygiene during 1935 and 1936.

As a basis for the establishment of maximum allowable concentrations of industrial fumes, the committee has before it a tabulation in which all standards known thus far to have been promulgated are combined with tentative figures proposed by the Division of Occupational Hygiene and the criticisms of 22 authorities in this country and abroad to whom these figures were submitted. This is believed to be a more comprehensive symposium of opinion on the subject of allowable fume concentrations than has previously been undertaken by any governmental authority.—Manfred Bowditch, Director, Division of Occupational Hygiene, Massachusetts Department of Labor and Industries, Boston, Mass., September 14, 1937.

SALLY LUCAS JEAN ELECTED PRESIDENT OF THE ASSOCIATION OF WOMEN IN PUBLIC HEALTH

AT the 17th annual meeting of the Association of Women in Public Health held at the Hotel McAlpin, New York, October 7, Sally Lucas Jean,* Executive Secretary, Health Section, World Federation of Education Associations, was elected to succeed Dr. Mary L. Lakeman as President of this national group of health workers in the fields of public health, medicine, nursing, bacteriology, chemistry, statistics, and health education from all parts of the United States.

* Fellow A.P.H.A.
† Member A.P.H.A.

The other officers include: Florence Mirick Ross, M.D.,† of Rhode Island College of Education, as Vice-President; Pauline B. Williamson, B.S.,* Director of the School Health Bureau, Metropolitan Life Insurance Company, as Secretary; and Marjorie B. Illig,† National Commander of the Women's Field Army of the American Society for the Control of Cancer, as Treasurer.

DELTA OMEGA OFFICERS

AT its annual meeting on October 6, Delta Omega, the honorary public health society, elected Thomas Parran, M.D.,* Surgeon General, U. S. Public Health Service, Washington, D. C., and William H. Park, M.D.,* Director Emeritus, New York Department of Health Laboratories, New York, N. Y., as honorary members.

The national officers for the ensuing year are:

President, Samuel C. Prescott, Sc.D.,* Cambridge, Mass.

Vice-President, John Sundwall, M.D.,* Ann Arbor, Mich.

Secretary-Treasurer, Milford E. Barnes, M.D., Dr.P.H.,* Iowa City, Iowa.

NATIONAL SAFETY COUNCIL OFFICERS

THE National Safety Council's new officers, elected at the 26th National Safety Congress and Exposition, held October 13, are:

D. D. Fennell, Chicago—President

W. H. Cameron, Chicago—Managing Director (reëlected)

C. W. Dempesy, Chicago, Vice-President for Finance

Harry Guilbert, Chicago—Vice-President for Membership

Frank Harrison, Chicago—Vice-President for Industrial Safety

A. V. Rohweder, Duluth—Vice-President for Community Councils

Walter S. Paine, Hartford—Vice-President for Engineering

A. W. Whitney, New York—Vice-President for Education

Governor Harold G. Hoffman of New Jersey—Vice-President for Public Safety

WORLD FEDERATION OF EDUCATION ASSOCIATIONS

LEADERS in health and education, concerned with promoting health through the schools of the world, met at Tokyo, Japan, in August, 1937, in the Seventh Biennial Conference of the Health Section, World Federation of Education Associations. There were 347 in attendance from 19 countries. All phases of Health Services, Health Education, and Physical Education were presented.

A report of the proceedings will be published within a few months. Current summaries will also be issued by the Secretariat for the benefit of Health Section members concerning international health services of all kinds, private and national.

The Secretariat of the Health Section, 200 Fifth Avenue, New York, N. Y., will continue to assemble reports on health problems in the various countries, together with methods used in solving these problems and the results obtained by such methods as they affect the school program and the health of children. The officers elected to serve for the next 2 years are:

Chairman: Prof. Clair E. Turner,* United States

Vice-Chairmen: Dr. Y. Yoshida, Japan; Robert H. Hazemann, M.D.,† France

Executive Secretary: Sally Lucas Jean,* United States

Treasurer: R. J. Faust, Jr., United States

ALABAMA PROVIDES SYPHILIS DRUGS

AS a part of its campaign against syphilis, the State Department of Health of Alabama will distribute without charge drugs for the treatment of venereal diseases. Heretofore this service was available only for the treatment of indigent persons.

* Fellow A.P.H.A.
† Member A.P.H.A.

INDIANAPOLIS CANCER CLINIC

THE Indianapolis City Hospital, Indianapolis, Ind., has received a gift of $100,000 to establish and endow a cancer clinic. Edwin L. Patrick, President and Secretary of the C. B. Cones & Son Manufacturing Company, is the donor. The clinic will be named Patrick Hall, in memory of Mr. Patrick's wife.

Complete equipment for the treatment of cancer, including X-ray machines and radium, will be provided and accommodations for 22 patients will be available. Dr. Charles W. Myers is superintendent of the hospital.

HOSPITAL FOR NEGROES

THE dedication of a group of 3 buildings for the care of feeble-minded Negro children took place in Crownsville, Md., July 23. Erected at a cost of about $283,000, the hospital is said to be the first state owned institution of its kind in Maryland.

Equipped with 100 beds, half for boys and half for girls, the buildings were laid out so as to facilitate enlargement to care for 500 children. Dr. Robert P. Winterode, Superintendent of the Crownsville Hospital, about half a mile away, is in charge. Twenty children were admitted July 26.

HEART DISEASE COURSE

THE New York Heart Association plans a second series lecture course on heart diseases during the fall and winter of 1937–1938. The first of twelve afternoon lectures will be given November 9, and they will continue at bi-weekly intervals up to and including April 26, 1938.

The course is endorsed by the New York Academy of Medicine, and is open to all practising physicians without registration or admission fee. It is designed to give the general practitioner a better understanding of problems pertaining to the treatment of certain types of heart disease. For the convenience of those residing outside of Manhattan, two of the lectures will be given in Brooklyn and one in the Bronx.

The first lecture will be on "The Management of Patients with Heart Disease," by Dr. Irving Roth, on Tuesday, November 9, at 4:30 P.M., in the Blumenthal Auditorium of Mount Sinai Hospital, New York. Other lectures in the course, to be given by leading heart specialists, will be announced later.

CENTENARY OF CHARLES FREDERICK CHANDLER

AT Columbia University, New York City, from October 6 to November 4, there was a celebration of the 100th anniversary of the birth of Charles Frederick Chandler, father of modern industrial chemistry, and the first public health chemist in New York City. There were included Chandler memorial lectures in the fields of chemistry, medicine, and public health. The Chandler Medal of Columbia University was presented to Dr. John Howard Northrop of the Rockefeller Institute for Medical Research.

Haven Emerson, M.D.,* Director of the Institute of Public Health and the School of Medicine, spoke on October 20, on New York's First Public Health Chemist.

GLENN DALE SANATORIUM

THE Government of the District of Columbia, on September 15, dedicated the new 5 story Glenn Dale Sanatorium for adults at Glenn Dale, Md. Dr. Thomas Parran * was the principal speaker. The Sanatorium represents a two million dollar plant with 400 bed capacity, built on a cubicle system, for

* Fellow A.P.H.A.
† Member A.P.H.A.

the hospitalization of tuberculosis. Most of the rooms are equipped for 2 patients. The addition of this adult division of 400 beds to the children's division makes a total of 700 beds and an investment of more than three million dollars for this Sanatorium. This is in addition to 200 available beds at the Gallinger Municipal Hospital, and a total of 900 beds against 662 deaths from tuberculosis in 1936. All municipal hospitals in Washington are now under the authority of George C. Ruhland, M.D.,* Health Officer.

GEORGIA PUBLIC RELATIONS BUREAU

THE Medical Association of Georgia has established a Public Relations Bureau to work in coöperation with the Georgia State Departments of Public Welfare and Health, it is reported.

With offices at the Association's headquarters, 38 Prescott Street, N. E., Atlanta, Ga., the Bureau will disseminate health information in a statewide educational campaign among physicians and the public.

MALARIA PROJECT

A SURVEY on malaria in Escambia County, Fla., will be financed by the Rockefeller Foundation; Dr. John E. Elmendorf, Jr., of the Foundation staff, will be in charge of the survey, with headquarters in Pensacola.

Of the $8,000 to be spent for the first year's work, the city and county will each pay $1,000.

Dr. Elmendorf will also be Director of a malaria division to be formed in the Escambia County Health Department.

DIABETES RESEARCH

A TRUST fund of a million dollars has been given to the Children's Hospital, Pittsburgh, Pa., for "perpetual research in the causes, treatment and cure of diabetes in the youth of the Pittsburgh area." Miss Emily Renziehausen is the donor.

The first income of the fund will be used to build an addition to the hospital, to be known as the Renziehausen Memorial Ward and Clinic. In addition, Miss Renziehausen has given an eleven-acre farm as a site for a home for convalescent children.

It is provided that any income not needed for work on diabetes may be devoted to other research work and hospital service.

ALABAMA INDUSTRIAL HYGIENE DIVISION

THE Alabama State Department of Health has created a Division of Industrial Hygiene, with headquarters in Montgomery, with Dr. William F. Queen in charge.

PERSONALS

Central States

DR. JOHN E. ATTWOOD, of LaCrosse, Kans., has been appointed Health Officer of Rush County, succeeding DR. NORVAL W. ROBISON, of Bison, who held the position 4 years.

DR. FLOYD C. BEELMAN, of Wichita, Kans., has been appointed Health Officer of Sedgwick County.

DR. WARREN C. BREIDENBACH, of Dayton, Ohio, has been appointed a member of the Ohio Public Health Council, to succeed GEORGE D. LUMMIS, M.D.,* of Middletown.

CLIFFORD C. CORKILL, M.D.,† of Fennville, has been appointed Director of the new Joint District Health Department composed of Ontonagon and Baraga Counties, with headquarters at L'Anse, Mich.

JOSEPH W. DAVIS, M.D.,† of Charlotte, Mich., has resigned as Health Officer of Eaton County, to accept a similar position in Marion County, W. Va. He will be succeeded by MORLEY B. BECKETT, M.D.† (Health Officer of

* Fellow A.P.H.A.
† Member A.P.H.A.

Allegan County), as Acting Health Officer of Eaton County, until Dr. Davis's successor is selected.

WILLIAM DEKLEINE, M.D.,* Medical Director of the American National Red Cross, was awarded an honorary degree of Doctor of Science by Hope College, Holland, Mich., recently.

DONALD M. HARRIS, M.D.,† of Omaha, Neb., has been named Director of the new health unit established in Lincoln County, with headquarters at North Platte.

DR. DAVID KLIGER has been appointed Coördinator in Wayne County for the administration of the afflicted children acts. Dr. Kliger took office September 1, with headquarters at the Juvenile Division of the Probate Court, 1025 East Forest Avenue, Detroit.

DR. EDWARD A. MEYERDING,† of St. Paul, Minn., Secretary of the Minnesota State Medical Association, and Executive Secretary of the Minnesota Public Health Association, has been granted a year's leave of absence by the State Medical Association.

DR. STANLEY L. MOSESKI, of Grand Rapids, Mich., has been appointed Health Officer of Yuma County, Ariz., on a full-time basis. He succeeds DR. CALVIN A. EATON, of Yuma, who held a temporary, part-time appointment.

A. L. RINGLE, M.D., who recently completed a course in Public Health at the University of Minnesota, Minneapolis, Minn., has been appointed Cowlitz County Health Commissioner, with offices in Kelso, Wash.

DR. HENRY G. STEINMETZ, Assistant Superintendent of the Logansport State Hospital for the last 3 years, has been appointed Supervisor of Health in the Sixth District, composed of Monroe, Lawrence, Brown, Morgan, and Johnson Counties, with headquarters at Indiana University, Bloomington, Ind.

HOMER H. WILLIAMS, M.D., Bacteriologist in the Health Department of Dayton, Ohio, since 1923, has been appointed Health Commissioner, to succeed the late ARTHUR O. PETERS, M.D.†

Eastern States

MARGARET G. ARNSTEIN, R.N.,† formerly Consulting Nurse in Communicable Diseases in the New York State Department of Health, Albany, has been appointed Assistant Professor of Nursing Education on the faculty of the University of Minnesota, Minn.

OSKAR BAUDISCH, PH.D., recently of Stockholm, Sweden, has been appointed Director of Research at the Simon Baruch Research Institute for Balneology and Hydrology to be established at the state spa at Saratoga Springs, N. Y. Dr. Baudisch is a native of Austria; recently he has been Research Associate at the University of Stockholm. Plans for the establishment of the Research Institute have not been completed.

DR. WILLIAM W. BOLTON, of Lansdowne, Pa., has been named Director of the Division of Syphilis and Genito-Infectious Diseases in the Pennsylvania State Department of Health, succeeding DR. EDGAR S. EVERHARDT.

CHARLES WALTER CLARKE, M.D.,† formerly Medical Director of the American Social Hygiene Association, New York, N. Y., who was lent to the New York City Department of Health in 1935 to organize its Bureau of Social Hygiene, has returned to active duty with the Association with the title of Executive Director. WILLIAM F. SNOW, M.D.,*

* Fellow A.P.H.A.
† Member A.P.H.A.

is General Director of the Association.

DR. HILARY J. CONNOR, of the staff of the Rhode Island State Department of Health, Providence, has been appointed Superintendent of State Sanatorium, Wallum Lake, to succeed DR. ROBERT LEMLEY GARRARD, resigned.

FRANCIS V. CORRIGAN, M.D.,† was appointed Chief of the Bureau of Child Hygiene in the Rhode Island Department of Public Health on July 1. He was formerly Director of Clinical Activities in the Bureau of Child Hygiene.

DR. IRVIN E. DEIBERT, of Haddonfield, N. J., has been reëlected President of the New Jersey State Board of Health, and E. W. SMILLIE, V.M.D., of Plainsboro, has been elected Vice-President.

MARION A. GLEASON, M.D.,† Chief of the Bureau of Child Hygiene in the Rhode Island Department of Public Health for the past 13 years, retired on pension on June 30, 1937.

DR. FREDERICK W. PARSONS, New York State Commissioner of Mental Hygiene *since 1927, has resigned.*

GEORGE HERBERT RAMSEY, M.D., DR.P.H.,* Assistant Commissioner in the New York State Department of Health, Albany, has been appointed Commissioner of Health of Westchester County, N. Y., succeeding MATTHIAS NICOLL, JR., M.D.,* Commissioner since 1930. Subject to confirmation of the appointment by the State Civil Service Commission, Dr. Ramsey expects to join the staff of the Westchester County Department of Health about December 1, *1937*, and will succeed Dr. Nicoll as Commissioner on his retirement May 1, 1938.

DR. ROMEO ROBERTO has been appointed Director of Gray Oaks Hospital for the Tuberculous, Yonkers, N. Y., succeeding DR. EUGENE F. MCGILLIAN,† new Health Commissioner of Yonkers.

THEODORE ROSENTHAL, M.D.,† of New York, has been appointed Director of the Bureau of Social Hygiene of the New York City Department of Health, succeeding CHARLES WALTER CLARKE, M.D.

DR. CHARLES D. SHIELDS,† of Buffalo, N. Y., has been appointed Assistant District Health Officer for Central New York.

ALFRED E. SHIPLEY, M.D., DR.P.H.,* formerly Deputy Commissioner in the Department of Hospitals, New York City, will now give a majority of his attention to his duties as Professor of Preventive Medicine and Community Health in the Long Island College of Medicine, Brooklyn, N. Y. One of the new district health centers of New York City is to be operated in connection with Dr. Shipley's department.

ERNEST L. STEBBINS, M.D., C.P.H.,* District State Health Officer at Rochester, N. Y., has been appointed Director of the Division of Communicable Disease of the New York State Department of Health, Albany, N. Y.

V. A. VAN VOLKENBURGH, M.D., DR.P.H.,* District State Health Officer at Ithaca, N. Y., has been appointed Assistant Commissioner for Local Health Administration in the New York State Department, effective in September.

CECILIA E. WALSH,† Director of Public Health Nursing in the Bureau of Child Hygiene of Rhode Island, has resigned from that position. She is now connected with the American Red Cross as District Supervisor.

Southern States

DR. JULIUS B. ASKEW, of Little Rock, Ark., has been appointed Health

* Fellow A.P.H.A.
† Member A.P.H.A.

Officer of Independence County with headquarters at Batesville.

DR. THOMAS T. BOX, of Double Springs, Ala., has been named Health Officer of Winston County, succeeding HERBERT A. MCCLURE, M.D.†

DR. WEDFORD W. BROWN, Health Officer of the Athens-Clarke County, Ga., Board of Health, has been named President of the Georgia Public Health Association.

DR. ALBERT S. J. CLARKE, of Little Rock, Ark., has been appointed Health Officer of the district unit composed of Arkansas, Prairie, and Monroe Counties, with headquarters in Clarendon.

DR. RANDOLPH COMPTON, of Louisville, Ky., has been appointed Health Officer in Greenup County, Ky., with headquarters in Greenup.

DR. GEORGE M. DECHERD, of Austin, Tex., was recently appointed Health Officer of Austin, to succeed EUGENE O. CHIMENE, M.D.,† who resigned.

DR. ALBERT S. DIX, of Mobile, Ala., has been named Health Officer of Jackson County, succeeding DR. GEORGE E. NEWTON, formerly of Scottsboro, who was appointed to a similar position in Lauderdale County.

FLOYD S. DOZIER, M.D.,† of Clarendon, Ark., has been appointed Health Officer of the newly organized health unit in Polk County, with headquarters in Mena.

DR. LEROY L. FATHERREE, of Little Rock, Ark., has been appointed Health Officer of the Craighead and Poinsett District, with headquarters at Jonesboro.

DR. DOYLE W. FULMER, of Benton, Ark., has been appointed to take charge of the Division of Malarial Control of the Arkansas State Department of Health, Little Rock. Dr. Fulmer has recently returned from Harvard University Medical School, Boston where he took a year's graduate work on leave of absence from the State Department.

WILLIAM B. GRAYSON, M.D.,* of Little Rock, Ark., has been reappointed State Health Officer for a second term of four years.

DR. MARVIN M. HARRIS,† formerly Instructor in Bacteriology at the Johns Hopkins School of Hygiene and Public Health, has been associated with the Division of Laboratories of the Georgia State Department of Health at Atlanta since May, 1936, and has been appointed Director of the newly established Branch Laboratory of the Georgia Health Department at Waycross, Ga.

DR. MAX F. MCALLISTER, of Fayetteville, Ark., has been appointed Health Officer of Miller County, with headquarters at Texarkana.

DR. THOMAS J. MCCAMANT,† formerly Health Officer of El Paso, Tex., and El Paso County, has been appointed Health Officer of the San Antonio schools.

HERBERT A. MCCLURE, M.D.,† of Double Springs, Ala., Health Officer of Winston County, has been appointed Health Officer of the full-time Health Department that has been organized in Choctaw County.

DR. MARTLE F. PARKER, of Boaz, Ala., has resigned as Health Officer of Monroe County, to begin the private practice of medicine. He is succeeded by DR. GEORGE E. MADDISON, of Moncton, N. B.

DR. DERRIC C. PARMENTER, formerly of Greenup, Ky., and recently in charge of public health work in Greenup County, has been appointed Health Officer of Breathitt County, with headquarters at Jackson.

DR. MAURICE L. PETER, of Blackwell, Okla., has been appointed Medical Director of a new health unit established in Kay County.

* Fellow A.P.H.A.
† Member A.P.H.A.

DR. WALTER W. POIMBOEUF, of Bastrop, La., has been appointed Health Officer of Claiborne Parish, succeeding HARRY R. MARLATT, M.D.,† of Homer, resigned.

DR. WINSTON C. RIGGINS, of Little Rock, Ark., has been appointed Health Officer of the district composed of Ashley, Chicot, and Desha Counties, with headquarters at Hamburg.

FRANK L. ROBERTS, M.D.,† of Trenton, Tenn., will be in charge of the Department of Preventive Medicine which has been established in the University of Tennessee. The department will be jointly supported by the University, the Tennessee State Department of Health, and the Tennessee Valley Authority. Dr. Roberts will be full-time Professor of Preventive Medicine, and LLOYD M. GRAVES, M.D.,† Health Officer of Memphis, will be Associate Professor. An associate professor of epidemiology will be added January 1 and later an associate professor of sanitary engineering.

DR. ELIHU F. SLOAN, of Shannon, Ala., has been appointed Health Officer of Shelby County, Ala., succeeding DR. HUGH C. NICKSON, formerly of Columbiana, who has resigned to enter private practice.

DR. WILLIAM E. TAYLOR, of Springfield, Mo., has been appointed full-time Health Director and Instructor in Bacteriology and Physiology at Teachers' College, Springfield. Dr. Taylor has been in private practice.

DR. THOMAS M. TOWNS, of Clarence, Ala., has been appointed Health Officer of Blount County, succeeding SAMUEL D. STURKIE, M.D.,† of Oneonta, who accepted a similar position in Calhoun County.

ARTHUR M. WASHBURN, M.D.,† has been placed in charge of the Division of Communicable Disease Control of the Arkansas State Department of Health, Little Rock. Dr. Washburn has recently returned from Harvard University Medical School, Boston, where he took a year's graduate work on leave of absence from the State Department. He formerly served as Health Officer of Blytheville, Ark., and of Mississippi County.

DR. THOMAS OSCAR VINSON, of Macon, Ga., Assistant Health Officer of Bibb County, has been appointed Health Officer of Spalding County with headquarters at Griffin.

DR. LEVI C. WAYLAND, of Plainview, has been appointed Health Officer of Hale County, Tex., to succeed the late DR. EDGAR F. MCCLENDON.

RAYMOND E. WEHR, M.D.,† of Bedford, Ky., has been transferred as Health Officer from Johnson County to Trimble County.

THOMAS B. WILSON, M.D.,† of Longview, Tex., has resigned as Health Officer of Gregg County, to accept a similar position with the Corpus Christie-Nueces County Health Unit.

Western States

CHARLES M. CREE is Director of the Division of Health Education which has been established in the New Mexico State Health Department.

R. G. M. EHLERS, M.D., has been appointed Health Officer of Lewis and Clark County, and the City of Helena, Mont.

JACQUES P. GRAY, M.D., M.P.H.,* formerly Deputy Director in the San Francisco City and County Department of Health, and more recently Director of the Angeline Elizabeth Kirby Memorial Health Center, Wilkes-Barre, Pa., has become Director of Public Welfare for the City and County of San Francisco. Dr. Gray has returned to the Coast and assumed his new duties on September 10.

* Fellow A.P.H.A.
† Member A.P.H.A.

DR. RULAND W. HUSSONG, Health Officer of Phoenix, Ariz., has resigned, to enter private practice.

DR. RICHARD A. KOCH, of Tacoma, Wash., has been appointed Health Officer of Whitman County.

ELROY F. MCINTYRE, M.D.,† of Santa Fe, N. M., has been appointed State Epidemiologist in the New Mexico State Health Department, to succeed LEONARD A. DEWEY, M.D., C.P.H.,† who resigned to become State Epidemiologist of Washington. DR. FRANK W. PARKER, JR., formerly of Clovis, succeeds Dr. McIntyre as Health Officer of the First District.

HOWARD L. MCMARTIN, M.D., of Twin Falls, Idaho, has been appointed Director of the Twin Falls County Health Unit, succeeding JAMES W. HAWKINS, M.D.,† who became state Health Director.

KARL F. MEYER, PH.D.,* Chairman of the Department of Bacteriology and Director of the Hooper Foundation for Medical Research, University of California, San Francisco, Calif., has been awarded the honorary degree of Doctor of Medicine at the University of Zurich, Switzerland, his alma mater.

DR. HARRY E. RHODEHAMEL, of Spokane, Wash., was elected President of the Public Health League of Washington at the annual meeting during the convention of the Washington State Medical Association in Seattle in July.

DR. JOHN C. SHARP, of San Jose, Calif., has been appointed Director of Public Health of Monterey County.

DR. JOHN H. TRUESDAIL, recently a Rockefeller Foundation fellow working with Dr. Roger J. Williams at Oregon State College, has become associated with Truesdail Laboratories, Inc., in Los Angeles, Calif., founded and directed by DR. ROGER W. TRUESDAIL.†

EDWARD L. VAN AELSTYN, M.D.,† has been appointed to have charge of the Southeastern District of the new public health unit established in Utah, with headquarters in Price.

DR. HARRY C. WATKINS, of Hoquiam, Wash., has been appointed Health Officer of Grays Harbor County.

Canada

DR. CHESLEY F. BLACKLER, formerly of Montreal, Que., has been appointed Health Officer of Kingston, Ont.

DR. GEORGE E. MADDISON, of Moncton, N. B., has been appointed Health Officer of Monroe County, Alabama, with headquarters in Boaz, Ala.

DEATHS

DAVID HENDRICKS BERGEY, M.D., B.Sc., DR.P.H.,* research biologist and former Professor of Bacteriology and Hygiene at the University of Pennsylvania, Philadelphia, Pa., died September 5, at the age of 76. In 1915 he was elected President of the Society of American Bacteriologists. He was connected with the Department of Hygiene and Bacteriology of the University of Pennsylvania from 1893 to 1932. He was the author of *Bergey's Manual of* Determinative Bacteriology.

DR. H. K. MULFORD, Director of Research and Biological Laboratories of The National Drug Company, Philadelphia, Pa., died October 14, at the age of 71.

GEORGE H. SIMMONS, Editor and General Manager Emeritus of the *Journal of the American Medical Association,* died September 1 at the age of 85.

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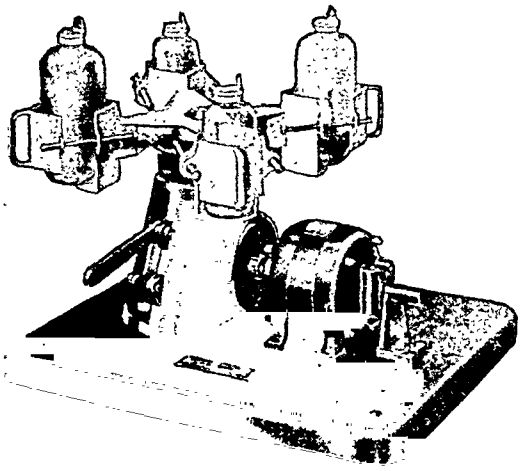
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Maryland-Delaware Water and Sewerage Association
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New England Sewage Works Association
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New York State Sewage Works Association
North Carolina Sewage Works Association
Ohio Sewage Works Conference
Oklahoma Water and Sewage Conference
Pacific Northwest Sewage Works Association
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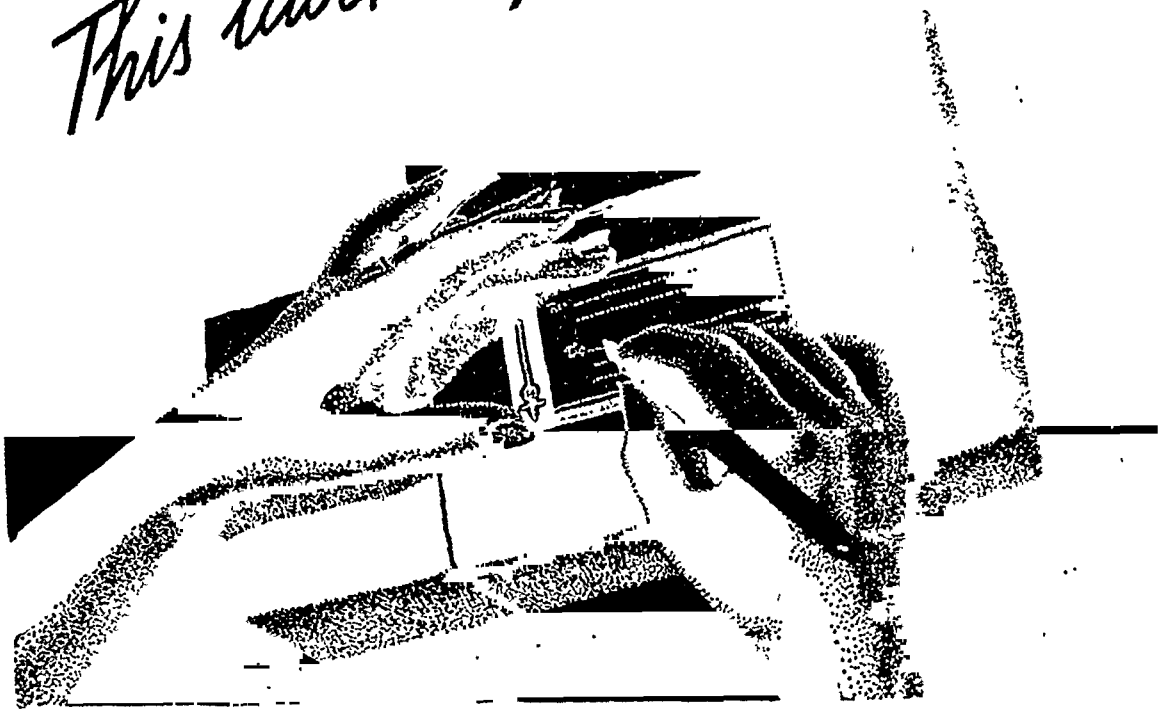
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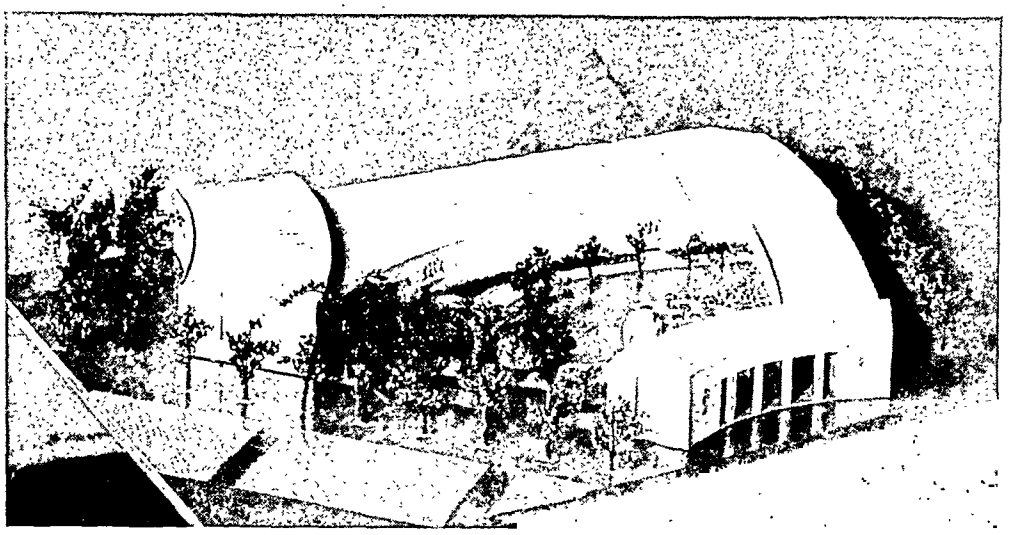
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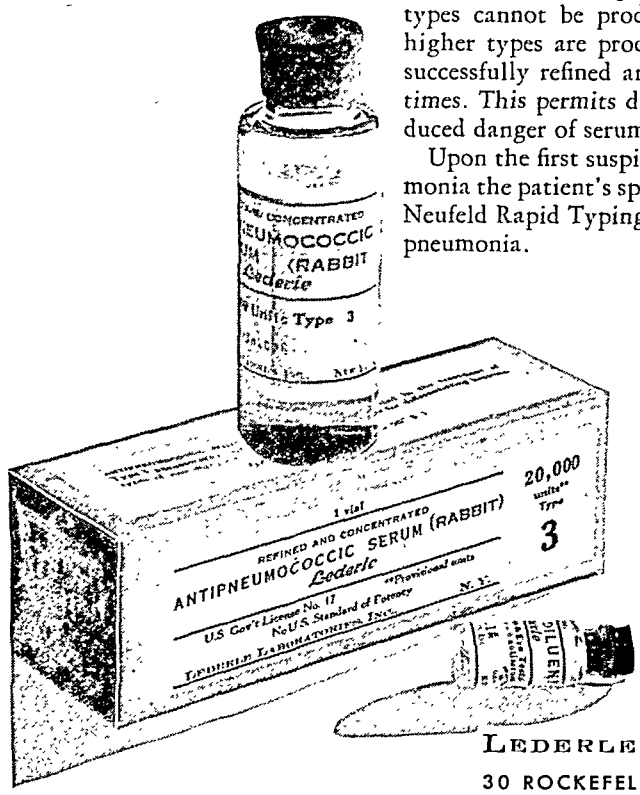
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PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY Frank Kiernan, 386 Fourth Avenue, New York.	New York, April, 1938.
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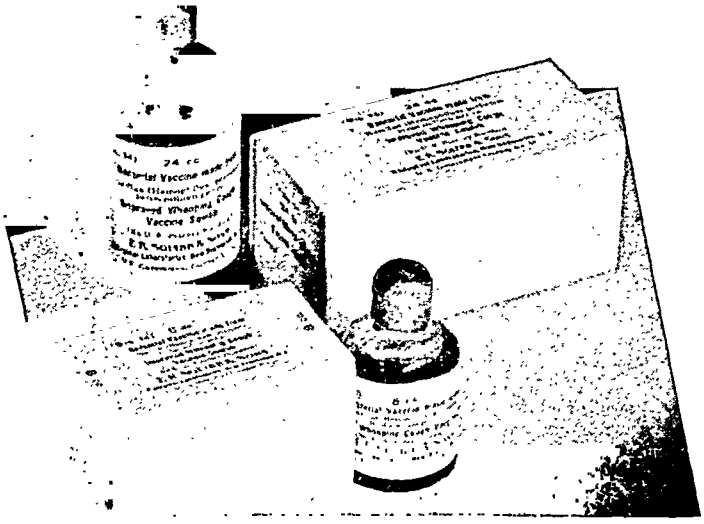
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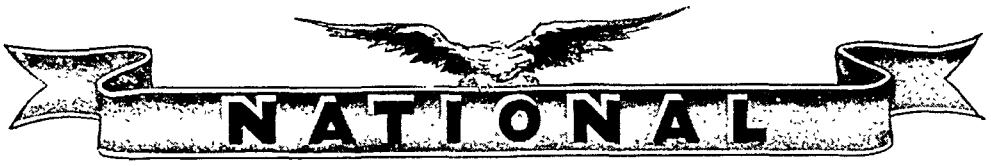
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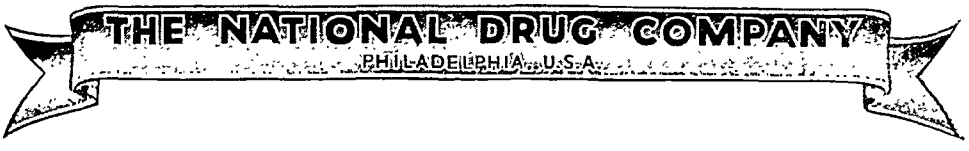


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A Lawyer's View of Vital Statistics*

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BECAUSE of the width of the subject matter and the diversity in the law of our 48 states, it will be obviously impossible for this paper to convey to any hearer any legal information of immediate practical utility in the occupation of the vital statistician.

Rather than to make dogmatic statements about the legal rules governing vital statistics, the objective will be to outline the relevant legal problems as they appear to one who is a lawyer and also a teacher of law school subjects particularly germane to the field of vital statistics.

Immediately the problem of emphasis or of relative importance is raised. For where to the professional vital statistician one topic may be far more important than another, the reverse may be true, or equal importance may be attached, where the lawyer is concerned. Thus, for instance, the lawyer may be equally interested in birth and death certificates, while the professional vital statistician may find that the former is a far more interesting and relevant matter and one which raises more frequent problems in his daily task. The lawyer may also be as interested in the proof of the facts of marriage, divorce, adoption, and legitimation, although these are frequently handled by other than professional vital statisticians as incidents of the regular task of recording court proceedings.

Then, too, the lawyer visualizes the central problem of vital statistics as that of getting a certified copy admitted in evidence, where the professional vital statistician may treat that as but one item in the larger picture of the general use of certified copies (or other records) by courts, other governmental agencies, insurance companies, employers, public schools, and others. The courts may set one standard for admitting records in evidence—other agencies may quite willingly take records not meeting judicial standards. There is no reason why this should not be so.

Thus let us define the lawyer's outlook on vital statistics as follows: The problem is that of securing evidence concerning facts of human pedigree, *viz.*, the physical events of birth and

* Read at a Joint Session of the Association of State Registration Executives and the Vital Statistics Section of the American Public Health Association, at the Sixty-sixth Annual Meeting, in New York, N. Y., October 7, 1937.

death, the relational facts incidental to birth of paternity and maternity, and the further relational facts of marriage and divorce, adoption, and the legitimation of those born illegitimate.

To a lawyer all are important because it may become necessary to prove them in his practice in order to determine the devolution of property or the solution of domestic relations problems or the prosecution and defense of persons accused of crime.

The remainder of this paper will be devoted to a statement of the legal problems of vital statistics as they appear to a lawyer, under the following heads: (1) administrative problems; (2) the admissibility of records in evidence; and (3) a separate treatment of the legal and evidential implications of legitimacy—a problem which has recently become important both for vital statistics and for social work generally.

I. ADMINISTRATIVE PROBLEMS

The name used for the first topic, for want of a readier one, is "*Administrative Problems*," *viz., the legal matters which the professional vital statistician encounters in his daily functioning in preparing vital statistics and before any question arises of their admissibility in evidence.*

The professional vital statistician is a government official whose office is created by law and whose duties are regulated by law. Hence there are presented to him in his routine work legal problems herein called administrative problems. I shall classify these problems under three heads, roughly approximating the three types of government records which are recognized by the law of evidence. These types of records are: (1) *registers* prepared by actual or quasi-government officials of events occurring within their cognizance; (2) *returns* collected by officials of information submitted to them by other officials or private persons; and (3) *certificates* issued by government officials to private persons attesting the happening of certain events or the contents of original records on file.

The task of the vital statistician covers all three of these stages and problems arise at each. Typically the process of vital statistics includes the recording by one having actual knowledge of an event (doctor, midwife, undertaker); the return of such information to the registrar; and the issuance by the registrar of certified copies (or less formal certificates) for legitimate use by others. It is proposed to mention typical problems arising at each stage as follows: (1) what to put in the original record; (2) what to receive; and (3) what to issue.

1. *What to put in the record*

While the matter of what information the original entrant should put in the record is largely regulated by varying local statutes, yet there is one aspect of it common to the whole American legal system and which may raise a problem for any type of record and in any state. This is the question as to the entrant's making a record of a fact not actually known to him but which was related to him by someone at the scene of the relevant event. A typical example of this would be the attending physician's entry—in a birth certificate—of what he was told concerning the name of the father and the fact of his marriage to the mother —facts hardly likely of being within the purview of the physician's actual knowledge.

Lacking a clear-cut statutory mandate to allow it, grave doubt is presented, legally, as to the admissibility in evidence (or the propriety of the registrar's accepting) of a record which purports to relate facts other than those occurring within the knowledge of the

original entrant. This is because of the law's distrust of hearsay, which we will see when the hearsay rule will be discussed farther along.

2. *What to receive*

Here again the question is largely governed by locally applicable statutes. Obviously the registrar should not receive a record which flagrantly departs from the statutory mandate governing the particular record. Yet insignificant imperfections are inevitable, either by way of omission or of commission. Some records lack detail commanded by statute, others contain material not provided for. How much of this sort of material is to be received is more often determined by departmental practice than by judicial rulings. The latter are difficult to obtain and are rarely obtained, either because the point is infrequently raised when the records are offered in evidence, or because a direct attack on the problem by mandamus or injunction against the registrar is unusual.

One aspect of this which is currently mooted is that of belated registration, *viz.*, should the registrar accept a record presented to him more than the statutory period after the happening of the event reported? If, for instance, the statute provides that physician or midwife shall report a birth within 20 days, may the registrar accept a report presented after that period?

Solution of this is usually made by the state attorney general or some other legal adviser. The two possible, and opposite solutions are: (1) that the registrar may not accept such a report because the period was meant to apply to him as well as to the reporting person; and (2) that he may receive it as the period was set up only to impose a duty on the one making out the record, and to provide the threat of a penalty to encourage promptness.

Common sense, and justice to the individuals concerned would seem to dictate the latter result, and yet the former has some support when we consider the general legal problem of the hearsay rule and of the exceptions thereto which cover vital statistics. One thing which makes vital statistics generally admissible by way of exception to the hearsay rule is that government records are more than normally trustworthy as evidence because they are prepared while the knowledge is still fresh in the minds of the entrant, so that inaccuracy due to forgetting is largely eliminated. Belated registration, on the other hand, involves the record being prepared long after the happening of the event when the lapse of time indicates less than normal accuracy.

Perhaps the best solution would be to permit belated registration but to require clear-cut indication of that quality on both original and copies so that all persons called on to use them might be on guard against being deceived by any inaccuracy resulting from the lapse of time between the event and its being recorded.

3. *What to issue*

Assuming the propriety of the original record and the version of it found in the registrar's files, the third type administrative problem is under what circumstances and to whom the registrar should issue copies of his records. The problem arises most frequently in connection with birth certificates showing the embarrassing fact of illegitimacy. Many registrars are reluctant to issue such certificates save to the individuals concerned or upon a court order. What are the legal aspects of the problem?

There are two conflicting legal policies involved. One is that of publicity — that governmental records should be open to all the public. This is one of the factors which make for

the general trustworthiness of public records, that mistakes will be unlikely because public inspection will show them up and cause them to be corrected. Under this policy it should be the duty of registrars to issue birth certificates of anyone to anyone. However, it is unlikely that anyone not really entitled to such certificates would take the trouble to institute appropriate legal proceedings to compel such issuance, and so it is that many registrars commendably refuse to issue such certificates to those who may wish to make improper use of them.

Opposed to the policy of publicity is that of privilege—frequently recognized in the law of evidence—occasionally with reference to public records. Thus, confidential statements between spouses are privileged, in order to foster the marital relation. Secrets of state, and testimony before a grand jury are privileged for the better functioning of the government agencies involved. Statements of client to lawyer, or of patient to physician are frequently protected. All of these rules suggest that there could well be added a more clearly defined statutory sanction for the privileging of such types of vital statistics records as need the protection.

II. Admissibility of Records in Evidence

While, no doubt, to the professional vital statistician the "administrative problems" just mentioned will bulk the larger, yet to the lawyer these are less significant, legally speaking, than the one now to be treated—the admissibility of records in evidence in judicial proceedings—a problem which appears sooner to a lawyer, particularly if he be a trial lawyer, under the rules of evidence.

While there are other rules that vital statistics encounter in the law of evidence, yet the hurdles they present are easily surmounted and there is left one rule—a large and important one—that gives us the principal body of problems that are raised by vital statistics when they are offered in judicial evidence. That rule is the hearsay rule.

The General Hearsay Problem

Put bluntly, the hearsay rule forbids X to give testimony of what Y told him and rather limits the testimony of witness X to that which X himself knows and remembers and requires that X narrate this in open court, under oath and cross-examination. So X cannot tell what Y told him for X does not know that himself, and the narration of Y, who does have the knowledge, is not given in the proper manner.

The law of evidence—in an effort to guard against erroneous jury verdicts resulting from untrained jurors being deceived by inaccurate evidence—has assumed that human narration is, generally speaking, untrustworthy and only becomes sufficiently trustworthy when limited to actual human knowledge and recollection which is narrated in a manner calculated to guard against error. So hearsay is forbidden because it is not the recollected knowledge of the one who is properly narrating and was not properly narrated by the one who did have the knowledge.

Official records kept by vital statisticians are hearsay and, save for the exceptions to the hearsay rule presently to be discussed, would be barred from judicial evidence. Should an original birth certificate be offered in evidence, for instance, with the doctor not present in court, proof of it would merely be proof by X (the authenticating witness) of what Y (the doctor) had said (in writing) out of court about the fact of birth. Should a certified copy of the same certificate be offered, it would be hearsay on hearsay, *viz.*, the registrar's out of court statement about the doctor's similarly forbidden

statement. But there are many recognized exceptions to the hearsay rule, several of which are relevant for vital statistics.

EXCEPTIONS TO THE HEARSAY RULE

The hearsay rule is most famous for its exceptions. These serve out the policy of the rule by recognizing selected types of human utterances which are intrinsically so trustworthy that they may safely be admitted in evidence without the usual safeguards required for the conditioning of normally untrustworthy evidence. They recognize qualities in the contained narration which tend to make it free from the usual dangers calling for oath, cross-examination, and narration in the presence of the fact-finder. These factors include unusual absence of motive to falsify, presence of motive for accuracy, and that the facts are of a sort easily perceived without mistake, easily remembered, usually for but a brief time before narration, and simply narrated without chance for mistake in phraseology.

Vital statistics possess qualities of these kinds and so it is that official records of the vital statistics kind involve at least three of the many recognized exceptions to the hearsay rule. These are the exceptions for pedigree, business records, and government records.

1. *Pedigree statements*

This exception covers part of what I shall later treat as "primitive" forms of vital statistics. It permits proof, by way of departure from the hearsay rule of any statement made out of court by one concerning facts of his "pedigree," *viz.*, facts and dates of paternity, maternity, birth, death, marriage, divorce, adoption, and legitimation—which facts are those that the lawyer visualizes as the bailiwick of vital statistics.

The theory is that narration of such facts is more than usually trustworthy because the speaker's knowledge of the fact is more likely to be accurate (one's own family history), that the danger of error because of lapse of time between event and narration will be offset by the probability of family discussion of the fact, and that narration can be made in simple terms not likely to cause error in understanding. Motivation to falsify is little likely for pedigree facts.

This exception probably antedates the others in providing primitive forms of vital statistics and ready means of proof of the facts contained therein. It is the rule which admits proof of a person's own statement as to what his name is—or when he was born. One's statements about his own immediate pedigree as much meet the exception as his statements about the marriage of a remote ancestor, or the details of the relationships of his cousins.

2. *Business Records*

The second exception is that for regularly kept business records. Such records constitute hearsay—as the "out of court" statement of the person making the entry concerning the item entered—and would be excluded were it not for the exception for them which recognizes the extraordinary trustworthiness of their content which justifies dispensing with the usual requirements.

The theory of the exception is that the content of business records is narration of a very trustworthy sort, so much so that there is no need of oath, cross-examination, and narration in court. There is believed to be usually little motive for a bookkeeper to make a false statement, and, in fact, the circumstances of employment, duty to superior, fear of censure, inertia of routine, all tend in the direction of willed accuracy. Accuracy of perception is more than usually likely because

of attention to duty; the time interval between perception and narration is usually so short that defects of memory are avoided; and the content of the fact narrated is so simple that errors in narration by inept choice of words are at a minimum. So it is that today regularly kept business records are admissible by way of departure from the hearsay rule. This exception does cover one form of vital statistics record—later to be classed as "primitive"—*i.e.*, the baptismal record of a church.

3. *Government records*

This exception to the hearsay rule is the one that squarely covers the use of vital statistics records in evidence. To the layman it might seem that there should be but one rule for both business and government records. For the keeping of official records is, after all, but a business. Analytically speaking, there is but one rule (or one exception to the hearsay rule) with but a single rationale. The explanation of their separateness is historical—they had separate origins and only recently have the respective rules so been modernized as to present the same appearance when their historical antecedents are ignored.

All that was said concerning the second exception (business records) can be reiterated to justify the quality for trustworthiness of government records that allows of their being offered in evidence despite the hearsay rule. Briefly, there is the same absence of motive to falsify, presence of motive for accuracy, duty, fear of censure, inertia, likelihood of accurate perception, brief recollection, and simple narration when a government official keeps a record of an event occurring within his knowledge. An added factor peculiar to public records is the usual public examination of the records—itself a voucher of trustworthiness.

Vital statistics records come squarely within this exception. All three types, the record of events occurring within the official's cognizance, the returns to a central agency of reports prepared by scattered officials, quasi-officials, and private persons, and the certified copy issued by the official to interested private persons make their appearance.

TYPES OF VITAL STATISTICS RECORDS, PRIMITIVE AND MODERN, WHICH THE LAWYER HAS OCCASION TO ENCOUNTER

Having outlined abstractly the legal rules which govern the admissibility of vital statistics records in evidence, it is now proposed to mention briefly the types of vital statistics records which the lawyer has occasion to encounter, primarily for use in the courtroom, occasionally for other purposes in convincing officials or others of the facts contained. One might roughly classify these into two groups, called "primitive" vital statistics, and modern ones.

The primitive types of vital statistics are those which are rendered admissible by the pedigree and business record exceptions to the hearsay rule. They include family bibles, gravestones, family genealogical charts, and baptismal records. Just as would be admissible proper proof of some one's having made an oral statement concerning his pedigree, so it is that the statements in writing in bibles, on gravestones, and on genealogical charts will come in. If proof is made that the bible is the one customarily kept in the family about which the entry speaks, no proof need be made as to whose handwriting the entry is in, for it will be taken that it was in the handwriting of some one whose statement, written or oral, would be acceptable under the pedigree exception. That a certain statement appears on a gravestone in a family lot is taken as the indubitable statement of some member of the family—qualified to speak—of the genealogical fact con-

tained therein. So it is with a genealogical chart found in the possession of some one of the family about which it speaks.

Church baptismal records, admissible legally through the business records exception to the hearsay rule, have been in use longer than centrally kept birth certificates. While they speak certainly only of the fact of baptism, rather than the fact of birth, yet even this may be valuable to a lawyer if he can win his case merely by proving the child to have been alive on a certain date (that of baptism) regardless of the exact day on which the birth occurred. Frequently this will suffice. Some jurisdictions might even admit the baptismal certificate to prove the date of birth noted thereon, on the theory that it was a record of the parents' properly admissible statement as to the fact of birth, itself justified by the pedigree exception.

Modern types of vital statistics might be grouped into three classes: (1) the records of miscellaneous officials, neither court clerks nor professional vital statisticians, kept for other purposes than vital statistics, yet which, on occasion, prove valuable to a lawyer in proving pedigree facts; (2) records kept by court clerks of a vital statistics nature; and, (3) regular vital statistics records kept by professional registrars in central record offices.

The first class is the vaguest. Typical examples would include the use of public school records to prove age and paternity, or an application for an automobile operator's permit to prove age or residence. The facts of age, paternity, marital status, all frequently appear on the records of miscellaneous government officials kept primarily for other purposes than as vital statistics records. Frequently the use of these can be justified in evidence under the usual government record rule. Not infrequently they are sought to be used under still another departure from the hearsay rule, as the admission of a party litigant. If, for instance, one gives on an application for a driver's license a different age than that alleged in a suit of law, his opponent will wish to offer proof of the application against him as a party-opponent's admission.

The second class offers records with which the average lawyer is most familiar, for he actually encounters them in his almost daily trips to the clerk's office of the court in which he practises. There along with routine court proceedings, records of land transfers and property mortgages, conditional sale contracts and judgment liens he finds an important group of vital statistics, *viz.*, records of marriages and divorces, and adoption proceedings. Records of courts in filiation or bastardy proceedings would also fall in this group. Divorce and adoption records are kept in court clerk's offices because they are incidental to the litigation accomplishing these ends. There is no particular reason for marriage license records to be kept there, save that court clerks have customarily been given the function of issuing various licenses, marriage, dog, fishing, and hunting, and so that important branch of vital statistics is assigned to them. Not infrequently transcripts of such vital statistics are made by the court clerks and returned to central vital statistics offices for safe-keeping.

Finally, the lawyer encounters the third class, that with which the professional vital statistician is most familiar, *viz.*, records kept by registrars in central record offices which exist for no other purposes than to keep records of vital statistics. These offices may serve a whole state, or a small geographical subdivision thereof, such as a county or city. I would include the records of the Bureau of the Census at Washington in this category, particularly as today their records are

coming more and more into use, particularly with reference to Social Security practices.

Frequently these offices are themselves offshoots of other state agencies —most usually a state department of health. The average lawyer would probably be curious to know whether registrars of vital statistics are quartered with health departments because the subject of vital statistics is naturally a component part of the science of public health; or vital statistics is a part of that science—and of its professional organizations—because the lawmakers have decreed that departments of public health shall handle vital statistics. No doubt the emphasis which the vital statistician puts on birth and death records, to the exclusion of marriage, divorce, and adoption records, is because of the fact that the former are concerned with health while the latter are not. Thus it is that this part of the paper can be ended in the thought with which it started, *viz.*, that the lawyer and the professional vital statistician attach different emphasis to the different types of vital statistics.

III. Legitimacy

A topic which recently has seemed important, in vital statistics, in social work, and in the law generally, is that of legitimacy. The vital statistician is faced with the problem of avoiding a showing of the embarrassing fact of illegitimacy on the birth certificate. The status of the illegitimate child in receiving relief bothers the social worker. The capacity of the illegitimate child to recover for wrongful death of the parent, or of the parent for the death of the child, is of importance to the lawyer who handles personal injury and wrongful death cases.

What is legitimacy—viewed from the standpoint of vital statistician, social worker, and lawyer? It is a legal concept, not a physical matter. Legitimate people do not wear different clothes, nor present different physical features from illegitimate ones. Furthermore, as a legal concept, it does not affect the individual standing alone. An illegitimate person can vote, own property, marry, drive a car, and do anything that a legitimate one may do. The quality of legitimacy is, legally, a relational one, *viz.*, it affects the legal nature of the relations between the individual in question and others. Being legitimate is really important in law only if one wishes to inherit from a propertied relative who forgot to make a will, or to collect damages for the injury to or the death of a relative, or to claim property left to a group in one family. Inasmuch as legitimacy is relational, the fact comes within the ken of vital statistics as the lawyer views it, *viz.*, proof of pedigree, *i.e.*, human relationships.

Even if one be born illegitimate, still he may acquire the status of legitimacy by subsequent activity of his parents. This is called legitimation. In a very few jurisdictions provision is made for official proceedings to accomplish it and where this is so, official records will be available. In most jurisdictions it is accomplished by the marriage of the parents and/or the father's recognition of the child as his own. When this is so, the only vital statistics records available will be those of the marriage. The fact of recognition will have to be proved informally.

In the light of the legal rules governing the establishment of the quality of legitimacy in court, that quality might be defined as follows: being born to a woman who, at any time during the preceding 9 months had a living husband, it being impossible to produce sufficient proof that the husband was not the father of the child. For the law recognizes the obvious difficulty

of being sure of paternity—as distinguished from maternity—and solves the dilemma by a presumption that the husband is the father, unless clear-cut evidence to the contrary establishes that he could not possibly have been the father. This is the so-called "presumption of legitimacy" which is the legal device for establishing legitimacy. This presumption may not be rebutted merely by showing that some other man might have been the father, for if the husband might have been, in law he is.

The modern tendency has been to ameliorate the legal disabilities of illegitimacy, few though they be. Statutes have been passed allowing illegitimates to inherit from more people; proof of subsequent legitimation may be more easily made under the statutes of some jurisdictions; and statutes have been passed allowing illegitimates to recover as members of the families of their parents, and *vice versa*.

To the vital statistician, no doubt, the most pressing problem in this trend is how to avoid the showing of the embarrassing fact of illegitimacy on the birth certificate of an illegitimate person. The suggestion is here made that, though desirable, it is impossible of achievement without a thorough revamping of the nature of birth certificates that will never win the approval of vital statisticians and legislators.

For it will not solve the problem merely to delete from the birth certificate the parts where should be indicated "legitimate or illegitimate" or "father and mother married or unmarried." There is still left the problem of names. If the father's name differs from the mother's that normally indicates the illegitimacy of the off-spring (with all due apologies to the Lucy Stone league). If the mother's different name be treated as her maiden name, there is still the problem of what name to give the child. If the same last name as the father's, and the child is raised in the mother's family, it will probably be called by the last name of that family, and the certificate name will vary from the normal one used by the child—itself an indication of something wrong. If the child be given the mother's name on the certificate, the difference from the father's will indicate illegitimacy.

To the writer's mind, the only possible solution of the dilemma is one that will probably never be adopted, *viz.*, to make no mention on the birth certificate of either the father's name or the mother's marital status, to give the child the last name by which the mother currently goes, with no reference to whether it is the maiden or married name. This will avoid any suspicion of illegitimacy and yet enable the child to have a certificate in the name by which he will be reared, whether it be father's or mother's maiden one. This has the disadvantage of depriving the birth certificate of its utility in proving the facts of paternity and marriage of parents, if any. It is a question whether it is worth while to deprive legitimate children of this type of record so as to avoid embarrassment to illegitimate ones.

Somewhat the same problem is raised in the parallel situation of issuing a new birth certificate to adopted children which will not show that they are adopted. Time does not permit going into this but it should be obvious that the difficulties are somewhat similar. One thing to keep in mind is that an adopted child still sustains some legal relations with the natural parents, just as an illegitimate one has a certain, though slim, legal claim on the father.

What Is a Delayed Certificate and Under What Conditions and Requirements Should It Be Filed?*

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BECAUSE of the rapid growth of our country, it is only within relatively recent years that many of the states with large rural populations, and in some cases with the people thinly scattered over wide areas, have been able to establish and enforce an adequate system of birth registration. In 1915 only 10 states had systems sufficiently complete to admit them to the registration area. Even today there are a large number of people living in places difficult of access to whom children are born without other medical attention than from some member of the family, and because of their isolation these people are often not aware of the importance of registration. Yet as conditions of communication improve many of these children will go out to work where birth certificates are required, or other occasions will arise where they will be needed and of course no certificate will be on record. Then there will always be, I fear, the problem of the doctor or midwife who will fail through carelessness, to register births.

I need not mention the many purposes for which birth certificates are required or desirable, as the recent publicity which has rightly been given to this matter has probably made you all familiar with them. However, within the last year or so this need has been greatly augmented by the Social Security Legislation of the various states.

To obtain some permanent record at a later date of these unrecorded births is not merely of academic importance in making our state records complete, but is of importance for several other reasons. In the first place, more than one occasion is likely to arise when evidence of date or place of birth will be required, and if this proof is definitely on file in the form of a birth certificate, it will not be necessary to produce the various affidavits and other evidence on every occasion. Furthermore, having once established a certain date and place of birth it will not be possible on some future occasion to introduce other evidence perhaps, of a false nature, to support a claim to a different set of circumstances. It will also make available a record at the place where anyone seeking information will first turn, namely the state registration office. Finally, records will be available for future generations seeking genealogical information.

* Read at a Joint Session of the State Registration Executives and the Vital Statistics Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

Since the information desired would be in most cases similar to that on a certificate of birth filed on time, the form used for such registration should be very much like any standard certificate of birth. It is usually desirable, however, to be able to distinguish these certificates from those registered on time, and for that reason a separate form is most commonly used as well as to facilitate the carrying out of various regulations regarding its filing.

Whatever form of certificate is used for these births occurring during some year previous to the one in which it is registered, the certificate is known as a "delayed certificate," and the act of registering it a "delayed birth registration." The term "delayed birth certificate," is, however, often used to denote a special form on which such births are registered.

It is quite possible in the case of older children or adults that the person who attended the birth and should have made out the certificate is dead, or for some other reason is no longer capable of making out a true certificate. In such cases it becomes necessary to have a parent or some older member of the family acquainted with the circumstances fill out the certificate. As they, or even the regular attendant when available may have to rely largely on memory, there is grave danger that he or she may be careless as to the exact facts, or even if some matter of financial importance is involved deliberately falsify. To meet this danger it is necessary to have some rules regulating the conditions under which the certificate is to be accepted, if it is to have any real value.

At the present time the law and regulations in various states differ widely, and it is a little doubtful whether or not a standardized procedure could be adopted satisfactory to all these conditions. Nevertheless, if possible, such standardization is desirable so that the value of delayed certificates will be more or less equal no matter where the state in which they may be registered.

In those states where registration has been compulsory for a long time, and the law strictly enforced, the number of unrecorded births will be relatively small, and it is possible to adopt very strict regulations governing the filing of a delayed certificate. In other states where an adequate system of registration has only been recently put into effect or where conditions are such that many children are delivered by persons ignorant of the law regarding registration, the number of delayed certificates received will be large, and too rigid regulations might present a real hardship to those concerned.

In making any regulations governing the conditions necessary for the acceptance of a delayed certificate we must bear in mind certain major considerations.

First, if our state records are to have the value that they should, and our office to have the confidence and respect of the people with whom we deal, we must safeguard the truth of our records. Second, we should wish our records to be as complete as possible. Then we have an obligation to the persons who wish to put a record of birth on file to make our regulations such that they will not interpose almost insurmountable obstacles, financial or otherwise. Finally we must protect the interests of those who may accept our records as evidence for settling claims or making other legal determination.

In some of our states there is a fee required for registering delayed certificates. I realize that there may be something to be said in favor of this in so far as it makes the person registering conscious of its importance, and there is furthermore the thought

that to avoid being obliged to pay this fee people may give more attention to having births registered on time. Personally I do not favor the idea. In the first place one of our principal objects should be to make our state records as complete as possible; to impose any large fee for late registration will considerably limit this objective, especially as a large proportion of those who have not been registered on time are the ones who can least afford to pay such a fee. It does not in reality assist in any way to make the certificates more correct, and persons wishing to file a false certificate for some dishonest motive will not be deterred. Such a fee has somewhat the appearance of a fine for failing to register on time, but a fine which is in most cases paid by the injured party rather than by the person responsible, that is, the attendant.

One idea, however, which does seem to me to possess merit, is to have a definite and fairly large fine for placing a false statement on a certificate. I also think it is a good practice to have the statement that there is such a fine printed on the certificate in such a way as to attract the attention of whoever signs it, as is done in some states. While of course the person making a false affidavit could be prosecuted for perjury, we have been advised against prosecution by the attorney general's office, in one or two cases, because of the difficulty in proving that the false statement was intentional.

The regulations for filing these certificates in use in our state is at the present time the one most generally employed, but it seems to me dangerously inadequate. Any person present at the time of birth and familiar with all the circumstances may fill out the delayed birth certificate for which we have a special form, on the back of which he makes an affidavit properly notarized that the facts stated are true. When we receive the certificate our records are only checked for that year and perhaps the year immediately before or after the year of birth. This is primarily to prevent duplication.

We have been fortunate in that no case has yet come to our notice of our having accepted and filed any certificate containing an intentional or notable falsehood. I often fear, however, that the significance lies only in the fact that they have not come to our notice. We all know how little a sworn statement means to many people, if by a false oath they can obtain money or other advantages. The amount of care taken by the notaries before whom the affidavits are made can be illustrated by our own experience. On one occasion someone came to our office to ask us to help him fill in the face of his certificate, which he had not yet done, but the affidavit on the back had been duly sworn to and notarized.

Another method which is more effective is to have the person appear before a judge of a circuit court to register his birth and present what evidence he is able. There is much to be said in favor of this method, but again there is the objection that it necessitates a fee which may seem very large to the person registering yet is in reality not large enough to cause the judge to look upon it as other than a nuisance. An alternative method is to have the certificate filed with the local registrar who examines the evidence and determines its correctness. So far as West Virginia is concerned, I doubt if this method would be very effective, unless the local registrar were personally acquainted with the applicant. I further doubt if all of them are capable of passing judgment on the evidence presented.

The state registrar does of course have a certain amount of discretionary powers regarding the acceptance of a

certificate, but it is my feeling that his determination should be based so far as possible on definite regulations, since merely arbitrary decisions may not always be fair, at least give opportunity for an accusation of unfairness, and may furthermore create dissatisfaction.

Of course some such method of inspection of certificates must be used I suppose where there are no laws or regulations governing the registrations of these delayed certificates if they are to have more than a very dubious value. In states such as ours there is no law whatever governing the acceptance of these certificates and their control is entirely a matter of regulations.

We have, like several other states, been accepting delayed certificates on the ordinary form when signed by a physician.

We recently, however, made a ruling which has not yet been enforced, that such certificates will only be accepted for births occurring 2 years or less before the date of registering. If a longer time has elapsed they must also be notarized unless the physician can write upon the certificate that the information is taken from his records made at or shortly after the time of birth.

In my own opinion the regulation that seems best to me requires an affidavit by the person making the certificate, as in our method, but in addition requires the presentation of suitable supporting evidence. In the absence of such supporting evidence the affidavits of 2 American citizens, not related to the person for whom the certificate is intended, and who were fully acquainted with the circumstances of the birth, are required.

Acceptable supporting evidence would be baptismal records, the records in the family bible, age given at school or possibly at time of marriage or on any occasion of a legal or similar nature. Provision should be made for the state registrar or his representative recording such evidence and returning the original record, sent in support, if so requested.

I believe it is better to have the affidavits and record of evidence written on the certificate itself, to avoid danger of loss, but if for any legal or other reason this is not suitable, any method of filing which would make the information readily available would be satisfactory.

I have said nothing as yet regarding delayed death certificates. They are similar by definition, in as much as they are certificates for deaths occurring in any year previous to the one in which they are registered. Up to the time of writing this article we had been asked on only two occasions to receive such certificates. The request to file them has been so rare that very few states have any fixed regulations regarding their filing so far as I know.

However, since beginning the writing of this paper I have been informed that the Department of Public Assistance has found several deaths to have occurred without death certificates having been filed. I was absolutely appalled when informed by that department that the number of unrecorded deaths found by them would probably exceed the number of unrecorded births and would run into hundreds.

Faced with this problem I have made the following provisional rulings:

When a certificate is signed by the informant, undertaker, and physician, we will accept it without requiring further evidence.

When it is signed by the informant and physician, or informant and undertaker, we will also accept it if sent from some responsible source such as the Public Assistance, whose investigators will have presumably made some examination of the circumstances. If not presented through some such source an

affidavit should be required from the informant.

If the death occurred without medical attention and no licensed funeral director had charge of the burial, we propose to require the informant to make affidavit of the truth of the facts given and to produce further evidence in the nature of an affidavit from any minister who performed the ceremony, or of two responsible people not related who know the facts to be true.

We are using the ordinary death certificate form with affidavits attached for the present, but may issue a new form after we have found, if possible, the reactions of this meeting.

Because of the extreme newness of this subject so far as we are concerned, I do not feel justified in going into the matter at any greater length in this paper.

It seems to be generally the case in all states where delayed certificates are accepted, that the certified copies of such have in theory the same legal status as copies of certificates filed on time but that in actual practice a court would consider their true value only such as accorded to the laws and regulations governing their filing. In order, therefore, that the courts may properly evaluate them, it seems to me that it is not sufficient to depend on the date of filing, but that such certified copies should unmistakably state the fact that they are copies of delayed birth certificates. Furthermore, it seems to me desirable that it be stated some place on the certified copy what the nature of the evidence or other matter filed in support may be in order that its value shall not be underestimated.

SUMMARY

A delayed certificate is a certificate for a birth or death occurring a year or more previous to the one in which it is filed.

It is desirable to have as many births and deaths as possible recorded, even though recorded late.

To prevent fraud certain regulations should govern the conditions under which they are accepted.

The value of imposing a fee for late registration is at best doubtful. Some regulations now in force in various places and worthy of consideration individually or collectively are:

An affidavit signed by the person filing a birth certificate that it is true.

A statement that the attendant at birth is unable to sign the certificate.

The production of supporting evidence.

The affidavits of two other persons not members of the family supporting the truth of the statements.

Certified copies of delayed certificates should plainly show that they are such; and it might be advisable to state thereon what evidence was filed in support.

Regulations on delayed death certificates have not been greatly needed until recently, and therefore need further consideration.

Some standardized procedure to equalize the value of delayed certificates in the various states seems advisable.

Medical Care as a Public Health Function*

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THE title assigned me today, "Medical Care as a Public Health Function" would perhaps make a more inclusive appeal to public health officials if it ended not with a period but a question mark. With the traditional task of public health far from completed, with so much yet to be done throughout the country in "leveling up" those preventive services long accepted as a definition of public health functions, it is quite understandable that the first reaction of public health workers to a function directly concerned with individual care should be one of hesitancy. "Better do our familiar and long accepted task well and not get into new controversial fields" is the way I have heard this first reaction expressed. Rarely, however, have I heard this position maintained after a full and open-minded examination of today's facts and conditions which clearly and overwhelmingly reveal that medical care as a public health function is not so much a new function which public health must take on as an extension of the function and services which public health leaders and workers have long claimed as their own and given their lives to advancing. No tribute could be too great to pay to those early scientists and public health officials whose tireless and brilliant efforts and sacrifices won the battles against the scourges, plagues, and epidemics of past years, found the causes for them, and established procedures and practices which have largely freed mankind from their devastation and destruction. As a consequence of the triumphs of science and their application in the health field, we find this startling contrast in mortality data: 50 years ago approximately 94 per cent of all mortality from disease was from acute illness, chiefly infections; today 75 per cent of all mortality from disease is from chronic illness. Three out of 4 of our deaths from disease are caused by 10 diseases. Listed according to the death rates which they are responsible for they are: heart disease, cancer, pneumonia and influenza, cerebral hemorrhage, nephritis, tuberculosis, diabetes, diarrhea and enteritis, appendicitis, and syphilis. All but 3 of these are chronic.

Where do they strike most often and hardest? In the homes of the poor, of that "one-third of our people, ill-fed, ill-housed, ill-clothed." This phrase must be amended by adding, "ill-cared-for, or not cared for at all, in sickness and death."

From 7 of those 10 diseases—all but cerebral hemorrhage, diabetes, and appendicitis—the death rates mount

* Read at a Special Session of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

steadily as income goes down. The death rate from respiratory tuberculosis is 7 times as great among unskilled workers as among professional workers; it is 3 times as great among the skilled as among the professional. Pneumonia kills 3½ times more unskilled workers than professional; death rates from diarrhea and syphilis are twice as high for the unskilled as for the professional; cancer's toll of the unskilled worker is 50 per cent higher than of the professional. The death rate from all causes is more than twice as high for the unskilled worker as for the professional.

The death rate of babies has been called the most sensitive index of the success of public health effort. It might well be called the best index of whether or not civilization is progressing. More than 20 years ago Children's Bureau Studies revealed the fact that the babies of the poor died at a notably higher rate than the babies of those in comfortable circumstances. While the use of infant welfare services in the last decade has resulted in a marked reduction in the infant mortality rate, large areas still exist in which the mortality of infants of the poor is of the order of rates observed over 20 years ago.

It is highly significant that the causes of infant deaths which have shown the greatest decreases in the past 40 years are the ones which show the largest excess in infant mortality among the low income group. The diseases which kill the babies of the poor in greatest excess are the very ones in which greatest general decrease in infant mortality has taken place. To quote the findings of a most recent study, infants in families with an annual income of less than $500 died at a rate of 168 per 1,000 live births, as contrasted with 30 per 1,000 in families with incomes of $3,000 or more. Between these extremes the infant death rates declined regularly as income increased.

Evidence has long proved that prenatal care is effective in reducing maternal as well as infant mortality. But at present only 30 to 35 per cent of women from low income families receive adequate prenatal care, in contrast with 80 to 85 per cent in the higher income brackets.

You will remember, perhaps, a few years ago the glib phrase heard frequently, "Well, anyway the depression was good for the health." The fact that the general death rate for the nation was slightly less in recent years was taken at face value, as an index to improved health of everybody. The Health and Depression Studies of the U. S. Public Health Service and Milbank Memorial Fund dispelled this illusion. They revealed the fact that the downward trend of mortality rates for the prosperous elements of the population masked the conditions among the unemployed and the lower income groups. It was found that while the death rate during the period 1929–1932 declined in families with full-time employed wage earners, it increased 20 per cent in families with no employed members or only part-time wage earners.

Shocking as these death facts are, revealing the highly disproportionate loss of life in our lower income homes, they are far from the whole picture. For every case of sickness resulting in death there are from 50 to 100 cases which do not die. Disabling disease, with its long drawn out suffering and misery, its day-to-day hopelessness, the want and denials which families undergo as a consequence, exact as cruelly excessive a toll as death in the homes of the poor.

Two years ago, at your Milwaukee meeting, I discussed the National Health Inventory which the U. S. Public Health Service was undertaking as

a Federal Works Progress Administration project, under the direction of Dr. L. R. Thompson, Director of Research, and George Perrott, Chief Statistician of the U. S. Public Health Service. I said at that time:

The objective of the survey is to develop facts that will eventually provide the average man with greater security against the hazards of disabling illness. Modern preventive medicine has made great strides in increasing our security against early death as evidenced by the fact that the expectancy of life has increased from about 40 years in 1870 to 60 years in 1935. This gain has been largely due to the prevention and control of the communicable diseases. It is now proposed to study the causes of chronic illnesses and disabilities which usually appear after middle age and which are so intimately associated with the economic and social status and habits of the people.

The survey is based on national recognition of the fact that the health service of the future will probably be expanded to cover other fields than the control and prevention of the communicable diseases. With the coöperation of the medical profession, the control and prevention and cure of all the ills of the flesh must be the ultimate goal of the health department.

Few of us realize what the presence of a serious or long-standing chronic illness in a household means as to the ability of the family to maintain itself on a self-supporting basis and procure the needed medical care.

Under-privileged families have the greatest need of adequate care because of the high rate of disabling illness and impairment among them. A recent survey made by the Public Health Service in 10 cities showed that the disabling illness rate was 56 per cent higher among families hardest hit by the depression than it was among their more fortunate neighbors, but that these "new poor" received only about one-half the volume of physician's care that the comfortable group obtained. The discrepancy would have been even greater except for the large volume of free care received by the poor group.

Free service included service free to the family because paid for by state or local government as well as service given free by the physician. It is becoming widely recognized that physicians and hospitals cannot be expected to render service to the indigent without remuneration and that there must be public responsibility for the medical care of these unfortunates who otherwise must depend upon the charity of physicians. The health survey will provide information as to the amount of disabling illness among these people and the volume of medical services now being received and will give for the first time an accurate picture of the need both of relief clients and the large group of the "medically indigent" who are able to subsist but unable to finance a serious illness.

Today we have preliminary data from this survey, covering as it does three-quarters of a million American families, three and a half million individuals. From it we learn that disabling illness among persons on relief is 68 per cent higher than among those in families with an annual income of $3,000 or over; that the unemployed have twice the disabling illness that the employed have; that Works Progress Administration workers have a disabling illness rate 40 per cent above that of other employed persons; that 1 in every 20 heads of families on relief is unemployed because of disability, while only 1 in 250 heads of families in the higher income groups is unemployed because of disability.

Overwhelming evidence from the National Health Inventory sustains and amplifies data previously compiled by innumerable smaller studies, establishing the conclusion that the excess of sickness and death among the poor requires preventive services and medical care proportionately greater in extent than that demanded by those in the higher income groups whose need is less. Yet even as this conclusion as to what must be done is reached, we face another set of facts, those showing that the groups of the population whose medical needs are the greatest, and which can only be met wholly or in part from public funds, are receiving far less care than the higher income classes whose individual resources place no restriction on the purchase of adequate service. Health Inventory data show that only 67 per cent of the cases

of disabling illness among relief persons received medical attendance exclusive of hospital care, compared with a figure of 80 per cent for those with a family income of $3,000 and over. The average medical services per case of disabling illness were about 50 per cent higher in the highest income group than among persons on relief. Bedside nursing care in the home was given to less than 1 per cent of the disabling illnesses among persons on relief; the proportion so attended in the group with family income of $3,000 and over was 10 per cent.

When facts of denial and destruction of human values such as these I have mentioned, are discussed in terms of the size of the population involved—the tens of millions of men, women, and children who are their victims—the problem of providing adequate health and medical services obviously demands concerted public action for its satisfactory solution. Between 40 and 50 millions of our population are found in families with an annual income of less than $1,000. Upward of 15 millions of the group with family income under $1,000 are found in rural areas which have special need for basic public health services, additional medical and nursing personnel, and hospital facilities. An additional group of some 50 millions of persons with family income between $1,000 and $2,000 requires public aid in the medical care of certain illnesses in which treatment is extremely costly because of their long duration or their demand for specific facilities for diagnosis or care.

As has been pointed out in a recent publication of the Social Security Board, *Social Security in America*, even if a minimum annual income of $2,000 could be maintained through various ways for American families, this amount would still be insufficient to enable them individually to budget against the costs of sickness.

Three possibilities are open to low-income families which suffer extensive illnesses: (1) they may go without needed medical care; (2) they may carry the burden of medical debts; or (3) they may rely upon the charity of doctors and hospitals, or receive their services from tax-supported and philanthropic agencies.

The annual money loss caused by sickness in families with incomes of less than $2,500 a year in the United States in 1929 was estimated as nearly $2,500,000,000. Of this huge sum about $1,500,000,000 represents the expenses of these families for medical care and about $900,000,000 constitutes their loss in wages resulting from sickness. The cost of care in sickness thus exceeds wage loss due to temporary disability. These figures are direct costs. They ignore the much larger costs of sickness represented by the losses in capital values of human life and the losses to commerce and industry. In normal times about one-third to one-half of all the families who have to seek public or private charity are compelled to do so because of the economic effects of accident and illness.

That there will be concerted public action no one measuring the human needs and denials can doubt. In this great democracy with its unsurpassed resources and potentialities for human progress, one-third of our people are not going to remain indefinitely ill-fed, ill-housed, ill-clothed, and ill-cared-for in sickness. Already they are on the march, and the only question which remains is whether those special groups experienced and trained in ways and means of meeting human needs, such as the public health group, are courageously and quickly going to step forward and join the march, to offer all they can give in constructive and progressive leadership and help in the meeting of the vast human problems of today.

The challenge which confronts public health workers today is in essence the same as that which confronted the great leaders of the past when human life was wiped out by epidemics and infectious diseases. The objective for which they strove is identically the same as yours today—to save life, conserve health, to prevent death and disease. So, as I stated earlier, you take on no new function when you turn to new ways and means to meet this unchanging objective. You only face the fact that your battle in the laboratory to find and conquer the causes of destructive diseases, and in the field to apply this knowledge, must not only be continued but widened and extended to the social and economic front. Death and disease are no less your responsibility to prevent because the cause for them has shifted, demanding care of the individual by public means when that individual's economic status makes impossible his securing for himself medical care and facilities necessary for saving life or health.

When the epoch-making Social Security Act became a law of our land, we were engrossed with the specific provisions it contained for safeguarding great numbers of our people from certain hazards and dependencies. These provisions are now being translated into living realities for several million men, women, and children. The distribution of preventive and medical services supported by public funds is being extended. The Act makes specific appropriations of about 14½ million dollars from federal funds in the present fiscal year for the extension of public health services, maternal and infant health, and care of crippled children, acceptance of which in most instances requires matching appropriations by the local and state health departments which directly administer these services. To a limited extent, the Act is making possible the recognition of public health responsibility for the care of the "high cost" illness, typified by cancer, a precedent which has already been established in the field of tuberculosis control. An additional step has been taken in this direction by the recent authorization of federal funds for a cancer research institute under the administration of the Public Health Service. But, in general, public health under the Social Security Act is, so far, expanding along previously accepted lines in which much fundamental work, of course, remains to be done.

Many states are creating departments of public welfare which coördinate all welfare activities including medical care. By admission of part of the social obligation to meet for the dependent groups covered by the Act—the aged, the blind and dependent children, the need for food, clothing, and shelter—the Act has stimulated states to make provision for their health needs also. Some recent state laws specifically mention those groups receiving public assistance funds as being eligible for medical care.

More important even than the special provisions of the Social Security Act and the aid they are bringing to special groups, is the underlying philosophy of that great Act. Through it we have taken our stand as a nation, that human welfare, human conservation is definitely a charge on government—national, state and local—we have entered an era of vital economics. We are pledged, as a people, to writing off our human deficit. Surely no more important step can be taken in this new era and toward this national objective than a concerted, intelligent, and courageous attack by the great public health forces on the needless illness and death of millions of our people through causes demanding fresh methods of approach and solution.

Organized medicine has admitted the problem and indicated it is receptive

to ideas, and is willing to coöperate.

The situation calls for leadership. No one formula or program will probably be found adequate to meet our varied needs, but a composite of many efforts and plans, some in experimental stages, some not yet under way, can and must be found. What group is better fitted to lead and carry through than the public health profession with its medical personnel and its tradition of fair dealing with the public and the medical profession alike?

A far step forward would be taken I think if the American Public Health Association formally recognized the problem of the present unequal distribution of medical services, and the widespread human needs of today, and charged a special committee to cooperate with the U. S. Public Health Service in extending through proper methods the long accepted functions of public health work to meet modern demands and needs of our people. I hope this action may be taken.

Vitaminizing of Margarine

THOSE concerned with the nutrition of groups on low income will be interested in a translation of a report on the vitaminizing of margarine from Denmark. Dr. I. S. Falk of the Social Security Board staff has made available a translation to the *Journal*.

The Danish Ministry of the Interior appointed a commission for considering the addition of vitamins to margarine. The names of the commission include several distinguished physiologists. The commission concluded that there was no doubt that the vitaminizing of all margarine with A and D vitamins will be of great importance in Denmark as many of the people will only in this manner be able to satisfy their natural vitamin requirements without exceeding their means. It was recommended that all margarine should contain 14 to 18 international A vitamin units and 0.1 to 1.0 international D vitamin units per gram. The commission recommended that the A vitamin effect of margarine should be secured by its containing the A vitamin itself and carotin, and in the same proportions as butter, *i.e.*, half of the effect being from A vitamins and about half from carotin. These recommendations were incorporated in an Act of Parliament and have already become effective. Anyone interested in the complete translation may obtain a copy at the American Public Health Association office.

Advances in Public Health Nursing*

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PUBLIC health nursing has advanced in many directions in recent years and today is on the threshold of inspiring developments. There are many more public health nursing services than there were before the depression —the government having greatly expanded its work in this field; the program of public health nursing is considerably widened; and the structure of public health nursing is being rebuilt, solid and scientific matter and manner being substituted for the somewhat meager content and trial and error methods of its infancy.

I intend to speak briefly of the first of these advances and somewhat more at length on the changes in program and structure. To do justice to any of them is impossible in 20 minutes.

The Social Security Act has made possible the creation of many public health nursing services in rural areas, generally as a part of county health units, and has also enabled existing county and municipal services to enlarge their personnel and programs. The principle of governmental responsibility for providing nursing care for the indigent sick has been established and a beginning has been made in putting this principle into practice.

The activity of the government and its assumption in many places of part of the work formerly carried by voluntary agencies has somewhat changed the purposes of the latter. Those voluntary agencies whose responsibilities have been lightened in volume now have before them the opportunity to define and develop the concept of family health work and to explore the possibilities and results of more thoroughgoing work with individuals. In so doing they will be following their historic rôle of path-finding. If their understanding and resourcefulness are equal to their opportunity they can make a contribution of profound value to the cause of public health—a contribution which may add greatly to the professional worth of public health nursing.

Turning to the next line of development, the expansion of the program of public health nursing, we face several new demands. The development of orthopedic nursing under the Children's Bureau finds public health nurses poorly prepared for this specialty but not indifferent to it. Steps are being taken which should enable us to go ahead in this field with greater competency in the future. A specially trained personnel is necessary and is in the first stages of preparation. Also under the stimulus of the Children's Bureau and through the efforts of the Maternity Center Association maternity nursing is going forward. Prenatal supervision is being strengthened through the wider development of mothers' classes and

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fathers' councils, activities which call for substantial, well organized content, and a sound understanding of teaching principles. With recognition of the fact that further reduction in infant mortality depends largely on reducing the number of deaths in the first month of life, increased attention is being given to the problem of prematurity—an area in which skilled nursing is of first rate importance and in which the possibilities of prevention need further study.

State and municipal programs for the reduction of pneumonia, brilliantly led by the examples of the New York and Massachusetts State Departments of Health, envisage the provision of more ample bedside nursing service both in numbers of patients nursed and in amount of service to the individual. It remains for us to convert this ideal into fact.

The increase in cardiac mortality and the subsequent examination of methods of combating it reveal two needs for systematic public health nursing service. There is a definite and pronounced need for intensive work with rheumatic fever patients, including nursing care, adjusting the environment so that a protective regime may be carried out, bolstering morale to the sticking point and protecting the other members of the family from infection if this proves to be a familial disease. In short, a rheumatic fever nursing program perhaps closely resembling the present tuberculosis nursing program is a necessity.

There seems also to be some hope of being of assistance in postponing adult cardiac deaths—many of which now occur in early middle age—through supplementing medical care with efforts to help the cardiac patient make the adjustments, emotional, occupational and otherwise, necessary for him to put into effect the physician's command for limited activity and rest—a rest dependent on mental as well as physical repose.

The increasing prevalence of diabetes has also aroused public health workers to an examination of what needs to be done—an examination which likewise reveals a need for more adequate nursing service. The present sporadic and limited nursing service to a few diabetics needs to be sharpened and developed into a systematic and rounded program for the many. Instruction in diet, in taking insulin, in special hygiene and in precautionary measures must be provided in much more complete and practical detail. Supervision in the maintenance of regime and help with the emotional and social dislocations are often necessary.

The launching of an active campaign against syphilis under Dr. Parran's courageous and vigorous leadership calls for a careful analysis of the part public health nurses should take. It is clear that we have an immediate opportunity, indeed responsibility, for concentrated work where syphilis is found in pregnancy and in infancy. Nursing service in a broad sense for interstitial keratitis will help in reducing blindness. Constructive follow-up service for clinic patients has value when we are soundly informed about the etiology of syphilis, have rid ourselves of moral judgments, and have sufficient grasp of the emotional complications to deal wisely with those we would help. We should also be able to help in the epidemiological approach to the control of the disease.

There can be no question of the imperative need for a great extension of nutrition teaching. Dr. Parran has said that "more children and adults alike suffer from faulty nutrition than from any other form of physical impairment except dental defects, which is

one result of improper diet," and charges that "we have made the most casual attempts to improve the diet of the millions fed at public expense and no more than a gesture at improving the food habits of the rest of the population." Dr. Julian Huxley, eminent English biologist, in considering "the relative degrees of influence, exercised upon successive generations by genetic and environmental or social conditions" says, "it is no longer legitimate to attribute the observed differences in physique and intelligence between social classes mainly to genetic factors. Genetic differences may, of course, exist; but the strong probability is that most of the differences are dependent on differences in nutrition."

That a nation can step upward in the scale of human efficiency as the result of knowing how to feed the body and of being able to buy the necessary foods seems a fair conclusion. The stature, strength and symmetry of today's children who have been reared from birth on nutrition by design instead of by chance are striking evidences of the possibilities. As awareness of the crucial rôle played by nutrition grows, the need for planning a definite community program will emerge, and also the need for implementing the health and family agencies with sufficient staff under the expert guidance of nutritionists to go into the problem of nutrition in detail with the families with whom they are working.

Perhaps the most revolutionary and potentially most valuable of all developments in public health nursing is the recognition that the patient's emotional state is one of the most important factors in his health, that the nurse in every contact she makes has an opportunity to influence emotional factors for better or for worse, and that the futility of her efforts—on those occasions when they are futile—can often be explained by her failure to realize and to take into account the possibility that there may be a deep-seated emotional cause behind the resistance of her patient. Assuming man to be a rational animal, she has not understood the limitations of the individual's conscious responsibility for his own motives and conduct.

This recognition, still in a very elementary stage, has already resulted in a new conception of the nature and possibilities of our work. In child health work a genuine revolution is setting in. The routine teaching of certain standard procedures is giving way to consultation with the parent regarding the particular nature and needs of her individual child, and effort to help her solve her individual problems. The unique opportunity which the nurse has, through the maternity and child health services, to guide the child's parents from the day of its birth, and even before, to an understanding of ways of caring for it which will contribute to its nervous stability and emotional health, is becoming daily more apparent. It is perhaps not over-sanguine to hope that the children of tomorrow may be spared some of the personality difficulties, some of the delinquencies, some of the mental breaks besetting the adults of today, because of having escaped faulty treatment leading to psychological trauma at the outset. Public health nurses are studying child psychology to gain understanding themselves of the interrelation of physical and emotional factors and of the growth of personality as a sound foundation for this extension of child health work into the realm of child guidance.

There is a new conception likewise of prenatal supervision, which is enlarged to embrace better understanding of the mother's emotional reaction toward her pregnancy, and toward the coming child, an attempt to help her release psychic stress, to prepare her in ad-

vance for the emotional as well as the physical care of the baby, and to help her prepare the older children for its coming.

There is a new conception of school health work. It is recognized now that health is not something we can bestow on the school child willy-nilly—except in so far as we can safeguard him from external dangers. The essential of health lies in the value the child himself attaches to it and in his habits voluntarily acquired and maintained. His own interest and volition must be aroused and guided. More knowledge of psychology is giving us better understanding, too, of the ways in which learning that is genuine enough to affect action takes place.

There is an enlarged conception of nursing care of the sick based on the principle that "every disease has a psychic component" as important to recovery as the somatic component; furthermore that no two individuals react alike even to identical circumstances and that the explanation of the patient's occasional failure to coöperate in treatment or to improve as expected may lie in some emotional factor often unrecognized by the patient but which doctor and nurse must take into account if resistance is to be overcome, or recovery achieved.

As for health education, so called, we are beginning to have some insight into how to make the message of scientific medicine mean something vital to the individual. We have been called health messengers and in that guise have naïvely thought that we could carry nuggets of science from the laboratory and deposit them on the doorsteps of the people and that good results would follow. We were blind to the truth of Dewey's statement that no more is something taught when nothing is learned than is something sold when nothing is bought. We thought that the factors of interest and of voluntary activity, without which teaching is worthless, could be aroused through reason. We tried to make up by vehemence and persistence what we lacked in insight, and when we failed we wrote our patient down as uncooperative. More recently we have realized that getting people to adopt new ways is a science based on an understanding of the psychic drives which govern behavior. Even so simple a thing as getting a prejudiced mother to believe that pasteurized milk is safest for her baby may call for something much more subtle than a rehearsal of scientific evidence.

This is not to say that nurses have not been successful in the past in overcoming resistance. The wonder is rather that we have been so often successful. But candor compels us to admit that we have also been baffled time and again and have laid our failure to the contrariness of human nature. Now we are beginning to see that had we understood human nature better we might have discovered the cause of the seeming contrariness and have made our assistance acceptable to the patient.

In short, public health nursing has advanced to the stage of knowing that it is not enough to be a messenger conveying a standard package which we have selected in advance as good for any recipient. We must have our goods in a variety of forms and wrappings and our methods of delivery must be as various as are the people with whom we are trying to establish fruitful relations. The prospective recipient's own plans and desires and interests must be our guide.

While we have been thus engaged in studying the technic of influencing human nature to better ways, we have also been overhauling the content of our teaching, service by service. We are becoming keenly aware of the bearing on public health nursing of scien-

tific data provided by the incessant research going on in biology, chemistry, medicine, and other sciences and are trying to work them into the framework of public health nursing to fill the gaps or to replace empiricism; much that was weak is taking on strength, and there will be increasing substance as our efforts are continued and intensified.

One should include among the advances the trend toward examination of the validity of traditional methods, the serious progress boards of directors of voluntary agencies are making toward equipping themselves for intelligent governance, and progress in many other directions.

Before closing, I must make it clear that I do not mean to imply that public health nursing has preëmpted all of the functions I have mentioned. Some are primarily in the field of family work or of nutrition, and some are common to all aspects of social work, using the term in its generic sense to include public health nursing. The nurse will often need the help of nutritionists and of medical, psychiatric, and family social workers, not to mention the settlement house worker and others. Very frequently she is one of a team which is working on a complicated situation. All of which means that she must be aware of the many factors entering into a given situation, though some of them may be outside of her special competence; must have insight into their relative importance and interplay; must be able to adapt her handling of the situation to these factors; and, finally, she must have the understanding to take her part in a common plan where other workers are involved.

Three conclusions of pressing importance to health officers and public health nursing administrators are inescapable if my understanding of recent and coming advances in public health nursing is even partially accurate. One is that the earlier goal of 1 public health nurse to every 2,000 persons no longer suffices if we are to live up to the possibilities of usefulness that are right on our threshold. Another is that every staff of nurses needs the expert guidance of nutritionists and psychiatric social workers either as members of the staff or available on part time. And the third is that we need superior nurses—superior in range and depth and accuracy of knowledge, superior in understanding the true implications of that knowledge, and superior in skill in putting it to use through our only medium—human relationships.

Diet and Resistance to Infection*

II. The Effect of the Maternal Diet

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THE purpose of this paper is to present studies on the effect of diet upon host resistance to infection under controlled experimental conditions. The question under consideration is: Can the natural resistance of the host to a specific disease agent be significantly altered by simple changes in diet? The diets compared in these experiments fall into two groups, (a) those in effect 2 weeks prior to and during the period of infection (called *experimental* diets), and (b) those in effect during the maternal period (pregnancy and lactation), but not during the period of infection of the progeny (called *maternal diets*). The spread of the disease agent from one host to another was excluded by isolation of the experimental animals. Since we are concerned with *natural* resistance to infection, the immunologic response of the host to the presence of the parasite is not included.

REVIEW

The effect of two different diets upon the resistance of mice to *B. aertrycke* infection was studied by Webster and Pritchett.[1] The Rockefeller Institute diet consisted of baker's bread soaked in fresh pasteurized grade B milk, supplemented by a grain mixture and dog biscuit. The McCollum diet consisted of whole wheat flour, casein, milk powder, sodium chloride, calcium carbonate and butter fat. When pregnant female mice were placed on these diets and their progenies, on reaching 8 to 10 weeks of age, were inoculated by stomach tube, those on the McCollum diet showed consistently higher survival rates. Later work indicated that the butter fat was responsible for the increase in survival.[2]

Topley, Greenwood, and Wilson[3] used the same test organism in a series of dietary comparisons by a somewhat different technic. The mice were placed on the experimental diets only 14 days before exposure. They were not inoculated, but were exposed to risk of infection by adding to each cage containing 100 normal mice, 25 inoculated by the intraperitoneal route. A diet of whole wheat flour, casein, butter, and salt mixture was no more satisfactory than a diet of whole oats, milk, and water. The addition of an excess of butter, or of lard, or of vitamin A concentrate, appeared to act unfavorably, as did the addition of carrots.

The difference in the results of Webster and Topley may be explained by the difference in technic, as mentioned

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by the latter. It is possible, also, that the dietary modifications employed by Topley were not such as to bring into relief the dietary factors operating in host resistance to this infection.

ported elsewhere.[4, 5] These dietary modifications were initiated 2 weeks prior to inoculation and were continued through the period of infection.

In the present series a comparison is

TABLE I

Experimental Diets
Type 350–390

Dry Mixture	*100 Calorie Portion*
Casein,* (dry)	7.2 gm.
Sucrose	17.0
Cellulose, regenerated	0.20
Yeast Concentrate[1]	0.40
Salt Mixture	*
Glycerol	0.15
Fat Mixture	
Linseed Oil (Linol)	0.30
Wheat Germ Oil	0.20
Cod Liver Oil Concentrate[2]	0.0002

* Casein and yeast concentrate were analyzed and the salts were added to make up the total mineral content given below.

Elementary Composition per 100 Calories

	Calories			*Milligrams*							
Diet	*Pro.*	*Carb.*	*Fat*	*Ca*	*Mg*	*K*	*Na*	*P*	*Cl*	*S* †	*Fe* †
371	25	70	5	160	24	195	115	155	177	6.4	2.8
372	25	70	5	40	6	49	29	72	44	1.6	0.7

1. Supplied by Harris Laboratories, Tuckahoe, N. Y.
2. Supplied by Vitex Laboratories, Inc., Harrison, N. J.

† S and Fe figures represent milligrams in salt mixture only.

DIETS

The composition of the diets used in our study is shown in Table I. Each ingredient containing more than a trace of the mineral elements was analyzed, and the total mineral content was calculated. Sufficient salts were added to make the total mineral content of the diet conform to a standard. Vitamins A, D, E, B_1, and G were supplied in definite excess of murine requirements.

These diets were found satisfactory for maintenance and health in uninoculated mice over a period of more than 9 months, but they were not satisfactory for reproduction.

The effect of variations in the mineral content of the diet has been re-

made between two diets in effect during the maternal period (pregnancy and lactation) and continued in the progeny until they reached the age of 6 weeks. Both groups were then put on the same diet, and 2 weeks later were inoculated. The two diets compared during the maternal period were "200," a modified Steenbock diet,[6] and "221," a Sherman diet[7] (Table II).

The comparisons are limited to the D-line (Swiss) mice, which for many previous generations had been maintained upon a diet of bread and milk, supplemented twice a week with a mixture of oats and buckwheat, and once a week with dog biscuit.[1] On their arrival in our laboratory, all were changed to diet 200 for 2 months. Some

TABLE II

Composition of Diets

Diet 200	*Parts*	*Diet 212*	*Parts*
Whole Ground Corn	64.0	Extracted Casein	20.0
Linseed Oil Meal	16.0	Sucrose	76.0
Crude Casein	5.0	Brewer's Yeast	10.0
Wheat Germ Meal	10.0	Salt Mixture	4.0
Powdered Whole Milk	5.0	Lard	2.0
Brewer's Yeast	2.0	Cod Liver Oil	2.0
Ground Alfalfa	2.0	Wheat Germ Oil	0.3
Sodium Chloride	0.5	*Diet 221*	
Calcium Carbonate	0 5	Ground Whole Wheat	66.0
Cod Liver Oil	1.73	Powdered Whole Milk	33.0
		Sodium Chloride	1.0

Elementary Composition per 100 Calories

	Calories			*Milligrams*					
Diet	*Pro*	*Carb.*	*Fat*	*Ca*	*Mg*	*K*	*Na*	*P*	*Cl*
200	16	68	16	118	19	152	62	90	98
212	19	72	9	149	18	270	43	145	52
221	16	59	25	105	13	199	136	139	232

of the breeding lots were then placed on diet *221* (which is similar in composition to their ancestral diet of bread and milk), while others were continued on diet 200. These diets are compared in Table III with respect to their effect on fertility, litter size, growth, and infant survival.

EXPERIMENTAL

The effect of diet upon host resistance has been tested in more than 2,000 mice, of 3 inbred lines obtained from Dr. L. T. Webster of the Rockefeller Institute. Two of these lines have reached the 7th generation in our breeding colony. The A-line are Rockefeller Institute Resistant Mice, produced by selective breeding and propagated for many generations by close inbreeding. The D-line are an unselected line of inbred Swiss mice.

The progenies of each generation have been tested at 8–9 weeks of age by inoculation with *Salmonella enteritidis*. A standard dose of 0.005 c.c. of

TABLE III

Breeding Data

Maternal Diets 200 and 221

	Diet 200	*Diet 221*
Number litters born	206	106
Average litter size	6.0	6.4
Fertility of mothers	73 per cent	79 per cent
Survival of young to:		
10 days	76 "	74 "
25 days	69 "	67 "
Average weight at:		
10 days	4.7 grams	4.8 grams
25 days	10.2 "	10.2 "
Inoculation	19.8 "	20.4 "

TABLE IV

High Mineral and Host Resistance
Survival of Progenies Inoculated with S. enteritidis

A-Mice

Group	Diet	Mice Inoc.	Surv. Each Week 1	2	3	4	Survival Per cent
M106	351	20	20	18	17	17	85
M118	361	20	20	19	18	18	90
M127	371	20	19	19	19	19	95
M128	373	20	19	19	19	19	95
M145	371	20	20	18	18	18	90
	Total	100	98	93	91	91	91.0

Standard deviation = 2.9

an 18 hour broth culture in a volume of 0.4 c.c. was administered by stomach tube to each animal. This dose contains 3 to 5 million organisms, as determined by the dilution method. The stock culture used has been kept on agar slants in the icebox, and has shown no significant change in virulence when tested at intervals with mice on a standard diet.

The mice were placed upon the experimental diet 2 weeks before inoculation. They were maintained in individual cages in an air-conditioned room, and observed daily for 4 weeks after inoculation. Groups of approximately 20 mice of the same genetic and dietary background were compared on each diet. These mice had no previous contact with the test organism, and possessed no specific immunity so far as could be determined. The survival percentage in each group at the end of 4 weeks can therefore be taken as an index of host resistance.

RESULTS

The results of a series of host resistance tests on the A-line of mice are shown in Table IV. The survival percentages in the individual tests indicate the normal variation. The standard deviation of the large group is calculated from the formula, $\sigma = \sqrt{\frac{p\,q}{n}}$ (method of Topley and Wilson [8]). The individual results fall within the limits $\pm 2\,\sigma$ of the mean and therefore on the normal distribution curve. The diet used in all these tests was the high mineral diet, with minor modifications in the kind and quality of the fat, which had no apparent influence upon survival.

TABLE V

High Mineral vs. Low Mineral
Survival of Progenies Inoculated with S. enteritidis

A-Mice

Experimental Diet	No. of Mice	Survival No.	Survival Per cent
High Mineral	100	91	91.0
Low Mineral	100	66	66.0

Diff. = 25.0 SED = 5.72 Quot. = 4.37 Odds 84,000:1

TABLE VI

Maternal Diet and Host Resistance
Survival of Progenies Inoculated with S. enteritidis

D-Mice

No.	Maternal Diet	Experimental Diet	No. of Mice	Survival	
				No.	Per cent
(1)	200	221	32	16	50.0
(2)	221	221	33	4	12.1

Diff. = 37.9 SED = 11.48 Quot. = 3.30 Odds 1,100:1

The comparison of the high mineral with the low mineral diet is shown, for the A-mice, in Table V, taken from another report.[5] The diet of the second group differed from that of the first in but one respect: the minerals were reduced to one-fourth the normal level. The mean survival in this group of 100 mice on low mineral intake was 66.0 per cent, as compared with 91.0 per cent on the high mineral diet. The difference is 25.0 per cent; the standard error of this difference is 5.72; the quotient is 4.37; and the odds against this difference being a chance result are 84,000 to 1. This type of statistical analysis [8] provides a means of measuring the significance of the results, and will be used in subsequent comparisons.

In the first experiment of the maternal diet series, the progenies from diets 200 and 221 were put on diet 221 during the experimental period. Table VI shows the survival in each group. Of those born on diet 200, 50.0 per cent survived the infection, whereas of those born on diet 221 only 12.1 per cent survived. The difference is 37.9 and the odds are 1,100 to 1. This suggests that the maternal diet is an important factor in host resistance. The test would be more critical, however, if the diet during the experimental period differed from the two maternal diets. This was done by instituting the purified experimental diets and changing the progenies from both maternal diets to the same experimental diet 2 weeks before inoculation. The results in Tables VII and VIII show a consistent difference between the two maternal diets. Using experimental diet 212, the survival in those born on diet 200 was 50.0 per cent, as compared with 8.7 per cent in those born on diet 221 (Table VII). The difference is 41.3 and the odds are 370 to 1 in favor of the significance of this difference. Using an experimental diet even more highly purified than the one above, the difference in host resistance of progenies from the two maternal diets is

TABLE VII

Maternal Diet and Host Resistance
Survival of Progenies Inoculated with S. enteritidis

D-Mice

No.	Maternal Diet	Experimental Diet	No. of Mice	Survival	
				No.	Per cent
(3)	200	212	20	10	50.0
(4)	221	212	23	2	8.7

Diff. = 41.3 SED = 13.78 Quot. = 3.00 Odds 370:1

TABLE VIII

Maternal Diet and Host Resistance
Survival of Progenies Inoculated with S. enteritidis

D-Mice

No.	Maternal Diet	Experimental Diet	No. of Mice	Survival	
				No.	Per cent
(5)	200	371	53	23	43.5
(6)	221	371	54	4	7.4

Diff. = 36.1 SED = 8.57 Quot. = 4.21 Odds 39,000:1

no less striking (Table VIII). The group born on diet 200 gave a survival percentage of 43.5, as compared with 7.4 in those born on diet 221. The difference is 36.1 and the odds are 39,000 to 1 in favor of its significance.

We sought next to determine whether the effect of these two diets on resistance to enteritidis infection is restricted to the period of pregnancy and lactation. The young are weaned routinely at 25 days, and are continued on the diet of the mother until they reach 6 weeks, when they are changed to the purified diet. It is possible that the diet of the young in the 2 weeks following weaning determines their host resistance. This was tested by changing a group of mice at the time of weaning from diet 200 to diet 221 (Table IX). Another similar group was continued on diet 200, while a third group, born on diet 221, was continued on the same. At 6 weeks of age all three groups were changed to the purified diet 371, and 2 weeks later all were inoculated. The slight difference in survival between the first two groups is not significant, showing that diet 221, when fed only after weaning, has little if any effect on host resistance. Those born on diet 200, however, and changed at weaning to diet 221, showed 55 per cent survival, as compared with 0 survival in those born on diet 221. The difference is 55.0 and the odds against this being a chance result are 3,200 to 1.

DISCUSSION

These differences in the host resistance of young mice from the two maternal diets appear to be the result of differences in the nutrition of the mother. Upon identical diets and environmental conditions during the experimental period, beginning 2 weeks prior to inoculation, the progenies from diets 200 and 221 respectively show a significant difference in survival per-

TABLE IX

Maternal Diet and Host Resistance
Survival of Progenies Inoculated with S. enteritidis

D-Mice

No.	Maternal Diet	Intermediate Diet	Experimental Diet	No. of Mice	Survival	
					No.	Per cent
(7)	200	200	371	20	13	65.0
(8)	200	221	371	20	11	55.0
(9)	221	221	371	20	0	0.0

Diff. (7–8) = 10.0 SED = 15.50 Quot. = 0.65 Odds 0.9:1
Diff. (8–9) = 55.0 SED = 15.25 Quot. = 3.61 Odds 3,200:1

centage. It has been shown that this difference is induced during the period of nutritional dependence upon the mother (Table IX).

Variation in animal species occur as the result of (a) mutation (change in genetic constitution), and (b) modification (change in environment). The D-mice used in these experiments were pen-inbred for many generations at the Rockefeller Institute and have been brother-sister inbred while in our laboratory. Sibling mating has not been continued long enough in this line to rule out absolutely the possibility of heterozygous progenies. However, the consistency of the survival data on the two diets makes the possibility of original differences in genetic constitution a remote one.

The diet of the mother during pregnancy and lactation is an important environmental factor in the development of the young and in these experiments appears to bring about modification of the host resistance characteristics of the progeny. It has been shown (Table V) that a homozygous line of mice (Line A), highly resistant to *S. enteritidis*, becomes susceptible when the mineral content of the experimental diet is reduced to one-fourth the normal. The diet during the experimental period may thus have an effect upon host resistance, but in the D-line mice this effect was minor compared with the influence of the diet of the mother. The data on the effect of maternal diet on the A-mice are not yet complete.

The technic used by Topley [3] subjected the mice to the experimental diet for only 14 days prior to inoculation, while that first employed by Webster [1] placed the young under the influence of the diet beginning early in intrauterine life. The difference in their results appears to be largely due to this difference in technic.

The two diets employed in our series differ widely in elementary composition (Table II) as well as in vitamin content, so that the specific dietary element or elements responsible for this modification in resistance characteristics are not yet identified. In our experience these two maternal diets are nearly equal with regard to fertility, litter size, and growth of the progeny (Table III), and we have no indication of any known dietary deficiency in mice maintained on them for 7 generations. The progenies from the two maternal diets were changed 2 weeks prior to inoculation to the same purified diet (with minerals and vitamins in excess of known requirements) and continued through the period of infection on this diet. Under comparable experimental conditions the host resistance of those from diet 200 was consistently and significantly greater than of those from diet 221.

These results with mice suggest that the maternal diet is a factor of major importance in determining the host resistance of the progeny. The diet of the mother may thus play an important rôle in evolution by influencing the survival of the offspring on exposure to the risks of infection.

SUMMARY

Two diets equally satisfactory for growth, reproduction, and rearing of young mice were found to differ in their effect upon the host resistance of the progeny to *Salmonella enteritidis* infection. The modification in host resistance characteristics was induced during the period of nutritional dependence upon the mother and persisted in spite of later changes in diet. *The diet of the mother appears to be a factor of major importance in influencing the survival of the offspring to the risks of infection.*

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NOTE: This work was aided by grants from the Rockefeller Foundation.

Beauty Aids

FOLLOWING is an excerpt from the memorial lecture delivered by Dr. Haven Emerson, celebrating the 100th birthday of Dr. Charles Frederick Chandler, a founder of the American Public Health Association:

Almost daily some new and secret-formula product is offered for human use and consumption, untested biologically before commercial exploitation and used widely by the ever gullible public, avid for novelty, convenience, or apparent profit, until some unsuspected but irremediable damage to the consumer has developed to warn physicians and sanitarians of a new problem in diagnosis, treatment, and prevention.

As one looks about at the cadaveric fingertips, the enameled toe-nails, the deformed eyebrows, the filled facial creases that try to reveal character but are cheated out of it, the hectic cheek reminiscent of the fever ward of a tuberculosis hospital, the ill-assorted daubs of aniline upon the lips, one wonders if it is worth the while of Congress to try to enact protective legislation, or health officers and their laboratories to attempt enforcement of local ordinances to save a beauty-mad generation from those qualities of cosmetics that threaten to replace the bloom of health with one more appropriate to a dish of wax fruit.

Advantages of Peptone Iron Agar for the Routine Detection of Hydrogen Sulphide Production*

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DURING an extensive study of the *Escherichia-aerobacter* "intermediate" group,[1] during which the production and detection of hydrogen sulphide was under investigation, it was found that peptone iron agar was much superior to lead acetate agar, the medium which has commonly been regarded as best for this purpose. This had been the experience of Levine, *et al.*,[2, 3] with organisms of the "intermediate" group. With positive cultures, the iron agar became intensely black in color and its use permitted the interpretation of the results to be made after a shorter period of incubation than with acetate medium. These advantages of the iron agar were so striking that it seemed important to determine whether it would also be superior to acetate agar with all members of the Gram-negative enteric bacteria, and whether it would prove to be more useful for the routine recognition of these organisms. The present paper gives the results of such an investigation.

METHODS AND MATERIALS

In all, 376 cultures were employed. All of the common species of the Gram-negative enteric group, the aerobic spore-bearing bacilli, the cocci, and the Serratia genus were represented. The cultural characteristics of most of the strains were determined in detail to permit exact taxonomic allocation to be established. Exceptions were made for the sporogenous bacteria, for which the species designations listed are those given by the laboratories from which the organisms were obtained.

The media for detecting hydrogen sulphide production, Peptone Iron Agar (Difco) and Lead Acetate Agar (Difco), were prepared in the usual way. They were dispensed in 7–8 c.c. amounts in ordinary 15 x 1.5 cm. culture tubes and sterilized in the autoclave at 15 lb. pressure for 20 mniutes. Inoculations were made along two opposite walls of the culture tube by the stab method, the needle being inserted to the bottom of the column of agar. The "source" cultures were either on agar slants or in broth. Incubation was at 37° C. and at room temperature for 6 days, unless positive results were produced sooner.

RESULTS

The production of hydrogen sulphide in the iron agar was evidenced by an intense blackening and in the acetate

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agar by the development of a brownish-black or a brown color, which was often so slight that the interpretation was uncertain.

The rate of hydrogen sulphide production in the iron agar was faster than in the acetate agar, the results in the former medium being available after incubation for from 8 hours to 2 days and those in the latter after 1 to 3 days.

Incubation at 37° C. was more favorable for hydrogen sulphide production than that carried on at room temperature, except in the case of certain strains of *Salmonella pullorum*.

Hydrogen sulphide was produced in the iron agar by every culture which formed it in the acetate agar, with the exception of 3 strains of *Salmonella morgani* and of 5 atypical strains of the Proteus genus, where very slight browning of the acetate medium occurred. Whether or not the interpretation of this reaction as hydrogen sulphide production was correct cannot be settled at this time. In the iron agar, these strains formed a brownish-red color which was not considered as evidence that hydrogen sulphide had been produced. Con-

TABLE I

Production of Hydrogen Sulphide in Peptone Iron Agar and in Lead Acetate Agar

Bacteria	No. of Strains Tested	Pos. Reactions: Peptone Iron Agar	Pos. Reactions: Lead Acetate Agar
Salmonella Schottmülleri	6	6	6
Salmonella aertrycke	3	3	3
Salmonella enteritidis	20	20	20
Salmonella suipestifer	2	2	2
Salmonella Morgani	3	0[1]	3[2]
Salmonella gallinarum	14	13	13
Salmonella pullorum (aerogenic)	14	14	14
Salmonella pullorum (anaerogenic)	22	16	15
Salmonella paratyphi	6	0	0
Eberthella typhi	15	15	15[3]
Shigella dysenteriae (Shiga)	3	0	0
Shigella paradysenteriae (Flexner)	9	0	0
Shigella paradysenteriae (Hiss & Russell)	1	0	0
Shigella paradysenteriae (Sonne)	20	0	0
Shigella dispar	4	0	0
Shigella alkalescens	3	0	0
Shigella ambigua	2	0	0
Escherichia "coli" group	23	0	0
Escherichia "communior" group	20	0	0
Escherichia-Aerobacter "intermediates"	31	20	20
Aerobacter aerogenes	20	0	0
Aerobacter oxytocum	15	0	0
Aerobacter cloacae	14	0	0
Aerobacter levans	2	0	0
Proteus vulgaris	4	4	4
Proteus mirabilis	19	19	19
Proteus X19 (Felix)	2	2	2
Proteus X19	2	2	2
Proteus X2 (Felix)	2	2	2
Proteus XK (Kingsbury)	2	2	2
Proteus, unclassified	5	0	0
Proteus, unclassified	5	0[1]	5[2]
Staphylococcus aureus	10	0	0
Staphylococcus albus	3	0	0
Micrococcus aurantiacus	1	0	0
Neisseria catarrhalis	2	0	0
Micrococcus, unclassified	12	0	0
Serratia, unclassified	9	0	0
Bacillus anthracis	1	0	0
Bacillus pseudotetani	1	0	0
Bacillus subtilis	4	0	0
Bacillus cereus	1	0	0
Bacillus megatherium	1	0	0
Bacillus mycoides	1	0	0
Bacillus, unclassified	7	0	0

[1] Production of a brownish-red color, totally unlike hydrogen sulphide blackening

[2] Production of a light brown color, which may or may not have been due to the production of hydrogen sulphide

[3] Production of a light brown color with many of the cultures rendered the interpretation of results difficult

versely, hydrogen sulphide was formed in the acetate agar by every strain which did so in the iron agar, with the exception of a single strain of *Salmonella pullorum*. A detailed list of the bacteria studied and of the results of the tests in the two media are given in Table I.

DISCUSSION

Peptone iron agar has been found to be more suitable than lead acetate agar for the production and detection of hydrogen sulphide. With positive cultures, it turns an intense black, thereby rendering the interpretation of results easy and reliable. Lead acetate agar, on the other hand, becomes brown or brownish-black, often to such a slight extent only that the results are uncertain. The difference between these colors is more marked with some cultures than it is with others. *Eberthella typhi* usually produces a light brown color in the acetate agar, but it always yields a distinct blackening in the iron medium. On the other hand, the members of the Salmonella genus which produce hydrogen sulphide give rise to definite blackening in both media. Positive results in the iron agar occur after a shorter period of incubation than in the acetate medium, obviously an advantage in routine testing.

The production of hydrogen sulphide may be employed successfully for distinguishing certain closely related species or types of bacteria. Thus, this reaction will separate *Salmonella schottmülleri, Salmonella enteritidis* and *Salmonella aertrycke* from *Salmonella paratyphi;* or *Eberthella typhi* from the dysentery bacilli, or certain strains of the *Escherichia-aerobacter* "intermediate" group from the typical members of the Escherichia and Aerobacter genera. Furthermore, it is also useful in separating members of the Proteus genus.

Although the period of incubation necessary to elicit positive results varies somewhat with the species under test, an incubation period of 4 days is sufficient with any of the cultures listed in Table I.

SUMMARY

It has been found advantageous to use peptone iron agar for the production and detection of hydrogen sulphide in a study of 376 bacterial strains, representing all of the common species of the Gram-negative enteric group, the cocci, and the aerobic sporogenous bacteria. The results have been compared with those obtained with lead acetate agar.

The production of hydrogen sulphide was manifested in the iron agar by an intense blackening and in the acetate medium by the development of a brownish-black or a brown color. The reaction in the iron agar was always much easier to interpretate than in the acetate medium, thus no uncertain findings were encountered.

The production of hydrogen sulphide in the iron agar was detected after shorter incubation than in the acetate medium, an advantage in routine testing.

The production of hydrogen sulphide is a valuable differential test in separating certain closely related bacterial species or types. The test has not found general favor, because of the frequent difficulty encountered in interpreting the reaction in lead acetate medium. The use of peptone iron agar eliminates this difficulty.

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A Practical Study of Procedures for the Detection of the Presence of Coliform Organisms in Water*

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THE study of certain selective media proposed for the detection of the presence of coliform organisms in water, which was initiated by the Committee on Standard Methods in 1934, has been directed, during the years of 1936 and 1937, toward an attempt to determine the comparative practical utility of these media when employed in routine water analysis.

The purpose of the study may be reviewed briefly. The eighth edition of Standard Methods of Water Analysis specifies, for detection of the presence of coliform organisms in water, the use of lactose broth as a primary medium. The 24 hour presumptive,† or the production of gas in the broth within 24 hours, is accepted as a satisfactory indication of the presence of the organism in certain raw waters, sewages, etc., where no great accuracy in the result of the test is required. When moderately accurate results are desired, 5 different methods of conducting a so-called "confirmed test" of the presumptives, 1 employing an agar plate and 4 employing liquid selective media, are permitted; and when extreme accuracy is demanded, the so-called "completed test," which consists in an attempt to isolate coliform organisms, is prescribed.

For many years previous to the publication of the last edition, *Standard Methods of Water Analysis* required the use of Endo or Eosin-methylene-blue agar plates in the tests now designated as the "confirmed" and "completed" tests. The detection of the presence of coliform organisms in the transfer made from the lactose broth presumptive to the agar plate, however, depends largely upon the facility with which these organisms produce characteristic colonies on the plate and upon the ability of the technician to recognize such colonies. Here was to be found a very vulnerable feature common to both of these confirmatory procedures. For although a technician with little experience may usually recognize coliform colonies on plates seeded from presumptives from rather polluted waters, raw or unfinished, even very experienced technicians are frequently puzzled when confronted with the assortment of atypical colonies which appear on many plates in the course of examination of less polluted waters such as wells, springs, lakes, and finished wa-

* Read before the Laboratory Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

† Unless otherwise defined, "presumptive" will be employed to designate the production of gas in a fermentation tube.

ters. At best, the fishing of suspected colonies from the agar plate is frequently a highly speculative procedure. So true is this that, as will be shown later, a loss of 20 to 30 per cent of isolations of coliform organisms is not an infrequent experience of routine laboratories. A most unsatisfactory result of the use of the agar plate methods is the possibility that two workers may secure from the same presumptives, through the use of the same method, quite different results. Chance and the personal factor often play too important rôles in these procedures.

In order to eliminate speculation and the personal factor from confirmatory methods, shorten the time required for the final result and, at the same time, effect a considerable reduction in the cost of water analyses, a very simple confirmatory procedure was introduced in the last edition of the *Methods,* viz., the transfer of a loop of the mixed culture from the lactose broth presumptive to a liquid selective medium, the production of gas in the medium to serve to indicate the presence of the organisms sought. This method possesses several advantages: the favorable feature of the lactose broth primary, its marked productivity, is retained; the personal factor and the speculation involved in the fishing of atypical colonies are eliminated; the result of the procedure is clean-cut, positive or negative; two workers, regardless of their experience in water work, are practically certain to secure identical results from the same presumptives. Furthermore, this method requires so little labor and material that all lactose broth presumptives may, at little cost, be confirmed, instead of the one or few obtained from the smallest amount of sample tested (another speculation enforced, in practice, by the use of the agar plate).

Whereas the time required for the lactose broth completed test procedure varies ordinarily from 3 to 5 days (if spores are encountered, several days more may be necessary), the proposed method requires from 2 to 4 days. Finally, if circumstances require it, the isolation of coliform organisms from the liquid selective presumptive may be attempted with, as will be demonstrated, quite as favorable results as those obtainable from the lactose broth presumptive. There is little doubt that, given a suitable medium, this confirmatory method should prove a boon to many overworked water laboratories which have been striving to conform to the requirements of *Standard Methods* and also permit, at a reduced cost, a much closer control of the supplies under their supervision than formerly was possible.

In the last edition of the *Methods,* 4 liquid selective media were suggested for use in this proposed confirmatory procedure. It was to determine the relative value of these media, with the view eventually to a reduction in their number, and to secure fairly conclusive information regarding the practical general utility of the liquid confirmatory method as compared with that of the usual, or agar plate "completed test," that the present study was undertaken by the committee.

OUTLINE OF THE WORK

Following the indications furnished by the investigations of Ruchhoft [1] and his collaborators on the relative productivity with reference to coliform organisms exhibited by certain media and on their relative inhibition of growth of various lactose-fermenting spore-formers, not only were the 4 selective media of *Standard Methods* (brilliant green bile, 2 per cent, crystal violet broth, fuchsin broth, and formate ricinoleate broth) chosen as confirmatory liquid media, but fuchsin broth was also chosen as a primary medium for comparison with lactose

broth. The composition and methods of sterilization of these media are shown in Table I. The materials required were provided, in dehydrated form, through the courtesy of Difco Laboratories, Detroit, Mich. The approval of each of the dehydrated selective media was secured from its proponent.

The laboratory procedures specified for the comparative work included, briefly, planting of 5 portions of each of at least two dilutions of sample (usually 5 portions of 1 c.c., and 5 portions of 10 c.c.) in lactose broth and also in fuchsin broth. Upon appearance of gas in either of these primary media, confirmation by the "completed test" was specified and, in addition, transfer of a loopful of culture from each lactose broth presumptive to brilliant green bile, crystal violet broth, fuchsin broth and formate ricinoleate broth. The production of gas in any of these confirmatory media was to be followed by the "completed test," in an attempt to determine the reliability of this indication of the presence of coliforms. Since the limited schedule of operations described might entail, in the course of examination of a single sample, 60 "completed tests," the large amount of work required for its application to even a small group of more or less polluted samples is manifest. The directors of 21 state, provincial, and city laboratories in the United States and Canada agreed to collaborate in the study. A list of these collaborators and of their laboratories is given below.

The volume of work accomplished by these laboratories is evidenced by the total of 1,213 water samples yielding presumptives which they examined and by the total of 24,071 "completed tests" which they performed. Hundreds of other samples were examined, but since they yielded no presumptives in either of the primary media, they are not included in the tabulations to follow. The Chicago laboratory, for example, examined 258 such samples of treated water, employing 10 portions of 10 c.c. each, which are omitted from the record. Certain other results, which are incomplete, are likewise omitted.

The summary of the results of this extensive coöperative effort will be presented in two parts: (1) A comparison of the 5 methods of confirmation of the lactose broth presumptives; (2) A comparison of the procedures employing primary fuchsin broth with or without "completed" confirmation, with the usual *Standard Methods* procedure.

I THE FIVE CONFIRMATORY PROCEDURES (AGGREGATE RESULTS)

These 5 procedures for confirmation of lactose broth presumptives include the usual "completed test" and the 4 "confirmed tests" of *Standard Methods* employing brilliant green bile, crystal violet broth, fuchsin broth, and formate ricinoleate broth.

A total of 1,213 water samples yielded 6,043 lactose broth presumptives which were confirmed by the 5

STATE AND PROVINCIAL LABORATORIES

Alabama—Birmingham, J. G. McAlpine and G. A Denison
Decatur, J. G. McAlpine and C. C. Johnson
Arizona, R. A. Greene and W. B. West
California, W. H. Kellogg and M. S. Foreman
Connecticut, F. L. Mickle and D. E. West
Georgia, N. M. DeJarnette
Indiana, B. H. Jeup and M. S. Campbell
Kansas, C. Ritter
Minnesota, H. A. Whittaker and George O. Pierce
New Jersey, J. V. Mulcahy and J. E. Bain
New York, F. W. Gilcreas
Ohio, L. F. Ey
South Dakota, C. H. Hunter
Ontario—Fort William, A. L. MacNabb and J. W. Bell
North Bay, A. L. MacNabb and W. M. Wilson
Toronto, A. L. MacNabb and A. D. McClure
Quebec, M. H. McCrady and J. Archambault

CITY LABORATORIES

Chicago, Ill., J. L. White and R. E. Noble
Indianapolis, Ind., H. E. Jordan and L. C. Boatman
Minneapolis, Minn., F. Raab and George Lundell
St. Louis, Mo., A. V. Graf

TABLE I

Media

Medium	*Comparison Materials in Grams per Liter*	*Amount of Dehydrated Media per Liter and Media per Tube**	*Sterilization*
Lactose broth (Standard Methods)	Beef extract 3.0; peptone 5.0; lactose 5.0	13.0 gm. per liter. 10 c.c. per tube	15 lb. for 15 min.
Fuchsin lactose broth	Beef extract 3.0; peptone 5.0; lactose 5.0; basic fuchsin 0.015	13.0 gm. 10 c.c. per tube	15 lb. for 20 min.
Brilliant green bile	Oxgall 20.0; peptone 10.0; lactose 10.0; brilliant green 0.0133	40 gm. 10 c.c. per tube	15 lb. for 15 min.
Crystal violet lactose broth (Salle)	Peptone 5.0; dipotassium phosphate 5.0; potassium dihydrogen phosphate 1.0; lactose 5.0; crystal violet 0.00143	16 gm. 10 c.c. per tube	15 lb. for 15 min.
Formate ricinoleate broth (Stark and England)	Peptone 5.0; lactose 5.0; sodium formate 5.0; sodium ricinoleate 1.0	16 gm. 10 c.c. per tube	11 to 13 lb. for 15 min.

* For sample portions of 1 c.c. or less. For larger portions of sample, see *Standard Methods of Water Analysis*, Eighth Edition.

methods. Since the appearance of gas in the selective liquid media was also followed by the "completed test," the total of presumptives subjected to the "completed test" numbered 21,168 from which 15,538 coliform isolations were secured.

The aggregate "completed test" results obtained from the confirmation of the 6,043 primary lactose broth (L B P) presumptives through the use of the 5 different methods, are shown in Table II.

It will be observed, in columns 1 and 2 of Table II, that the greatest number of confirmatory presumptives, as well as the greatest number of coliform isolations, was obtained from the formate ricinoleate broth, and the smallest number in each instance from the brilliant green bile. On the other hand, the proportion of the presumptives which yielded coliform isolations was greatest when brilliant green bile was employed, and least when formate ricinoleate was employed.

The figures of column 3 represent the number of lactose broth tubes, from which coliform organisms were not isolated by the particular procedure in question, but from which they were isolated by one or more of the other methods. These figures show that the usual "completed test" failed to isolate coliforms from 504 lactose broth presumptives which, when transfers were made from them to the selective confirmatory media, were proved to contain the organisms. Thus, by means of the 4 liquid confirmatory procedures, an additional 8.3 per cent of the lactose broth presumptives were shown to contain coliforms. Adding this proportion to the 51.7 per cent of complete confirmations effected through the use of the usual procedure, the total of 60 per cent of presumptives completely confirmed, of column 4, is obtained. In other words, 60 per cent of the lactose broth presumptives were proved, by the use of 5 confirmatory methods, to contain coliform organisms.

TABLE II

Results of 5 Different Methods of Confirmation of 6,043 Lactose Broth Presumptives Obtained from 1,213 Samples

	1	2		3		4	
		Coliforms Isolated		*Coliforms Isolated from Corresponding Lactose Broth Presumptives by Other Procedures*		*Sum of Columns 2 and 3; Tubes Containing or Probably Containing Coliforms*	
Confirmation Procedure	*Presumptives No.*	*No.*	*Per cent of Presumptives*	*No.*	*Per cent of Presumptives*	*No.*	*Per cent of Presumptives*
SMC *	6,043	3,124 (3)	51.7	504	8.3	3,628	60.0
BG (+SMC)	3,488	3,074 (8)	88.1	225	6.5	3,299	94.6
CV (+SMC)	3,742	3,101 (4)	82.9	289	7.7	3,390	90.6
F (+SMC)	3,804	3,072 (6)	80.8	275	7.2	3,347	88.0
FR (+SMC)	4,097 (6)	3,199 (11)	78.1	324	7.9	3,523	86.0

The first figure of column 4 indicates that the number of lactose broth primary tubes from which, by one or more methods, coliform organisms were isolated = 3,628.

NOTE: The figures in parentheses (which are included in the adjoining totals) represent the number of missing tubes, incomplete results, etc., which were considered positive in order to avoid loss of the remaining data obtained from these particular samples; a study of these data suggests that the error thus introduced is very probably negligible.

* The symbol SMC signifies the *Standard Methods* "completed test" procedure; BG, CV, F and FR signify the use of brilliant green bile, crystal violet broth, fuchsin broth and formate ricinoleate broth, respectively, as liquid confirmatory media.

The question immediately arises: if the 4 additional confirmatory procedures show that the usual "completed test" failed to detect the presence of coliform organisms in 8.3 per cent of the presumptives, or about 14 per cent of all presumptives proved to contain these organisms, what may be the *total* error of the "completed test"? Perhaps no entirely satisfactory answer will ever be given to this question. It is of some interest to note, however, that in the case of Quebec's lactose broth presumptives the use of one more confirmatory medium (a buffered non-formate ricinoleate broth) showed an additional "completed test" error of nearly 6 per cent of the error revealed by the other 4 methods.

The figures of column 3 which pertain to the selective broth procedures are not subject to the definite interpretation which can be applied to those which refer to the usual "completed test" procedure. It is very highly probable, however, that the production of gas in one of these selective media, following transfer from a lactose broth presumptive which has been proved to contain coliform organisms, is really due to the presence of the organisms in the selective medium, even though none have been isolated by one trial from the latter. From a practical standpoint, therefore, it is reasonable to attribute to all the figures of column 3 a like significance: presumptives which contained coliform organisms. The high proportion of 94.6 per cent of brilliant green bile presumptives in this category, is of particular interest; and it is to be remembered that even this figure probably *underestimates* the true proportion.

The number of presumptives of each of the selective media from which coliform organisms were not isolated by the routine "completed test," and the number of these, from the corresponding lactose broth primary of which coliform organisms were isolated by one method or another, are shown in Table III.

Whereas 17.3 per cent of the non-confirming lactose broth presumptives were proved to contain coliforms, 36 to 54 per cent (and probably a greater proportion) of the non-confirming pre-

TABLE III

Non-confirming Presumptives

Procedure	Number of Non-confirming Presumptives	Non-confirming Presumptives, from the Corresponding LBP of Which, Coliform Organisms Were Isolated by Means of Other Broths	
		No.	Per cent
LBP	2,919	504	17.3
LBP + BG	414	225	54.3
LBP + CV	641	289	45.1
LBP + F	732	275	37.6
LBP + FR	898	324	36.1

sumptives of the selective media may be considered, from a practical standpoint, to have constituted a satisfactory indication of the presence of the group.

For many years past the results obtained from the usual " completed test " following the lactose broth presumptive have been employed almost exclusively as a standard of performance for comparison with the performance of other procedures. Although it was well known that this standard method was imperfect, to what extent it was imperfect was a subject for speculation. The results of the present study, however, reveal that the error to which " completed test " results are subject is often of considerable magnitude. As a consequence, the abandonment of the usual " completed test " results as a performance standard and the substitution therefor of the " completed test " results secured through the use of *all* the confirmatory methods employed in the present study appear to be justified.

Table IV, accordingly, presents certain data of Table II in the form of percentages of the number of sample portions from which coliform organisms were isolated by any of the 5 confirmatory procedures. The first column of figures of this table shows clearly the comparative practical performances of these different confirmatory methods since, in the case of the selective liquid media methods, the production in them of gas is accepted, as in practice, to be the final indication of the presence of coliform organisms.

It will be observed that the usual "completed test," following lactose broth presumptives, detected the presence of coliforms in only 86 per cent of the sample portions which were proved to contain them. Of the selective media, the brilliant green bile indicated the presence of the group in 96.1 per cent, crystal violet broth in

TABLE IV

Results of 5 Methods of Confirmation of 6,043 Lactose Broth Presumptives in Percentages of Total of Sample Portions (3,628) from Which Coliform Organisms Were Isolated by One or More of 5 Methods

Complete Procedure	Confirmations Per cent of 3,628	Coliform Organisms Isolated Per cent of 3,628
LBP + 5 procedures	100.0 (isolations)	100.0 isolations
LBP + SMC "	86.2 "	86.2 "
" + FR	112.9 (gas +)	88.2 "
" + BG	96.1 (gas +)	84.7 "
" + CV	103.1 (gas +)	85.5 "
" + F	104.9 (gas +)	84.7 "

103.1 per cent, fuchsin broth in 104.9 per cent and formate ricinoleate broth in 112.9 per cent of the number of sample portions known to contain coliforms. The aggregate results suggest, therefore, that all of the selective liquid media confirmatory methods yielded results which were closer to the truth than were the results of the "completed test" procedure. If isolation of coliforms is required, however (in accordance with the alternative method, offered by the last edition of *Standard Methods*, of conducting the "completed test"), the last column of Table IV shows that the formate ricinoleate yielded the greatest proportion (88.2 per cent), and the other 4 methods 85 or 86 per cent of the number of isolations effected by all methods combined. Evidently, according to Table IV, the brilliant green bile, the crystal violet broth, and the fuchsin broth methods were the best of the 4 liquid media confirmatory procedures, and were also superior to the usual "completed test."

THE FIVE CONFIRMATORY PROCEDURES (INDIVIDUAL RESULTS)

Thus far, only the aggregate results reported by the collaborating laboratories have been considered. Comparable aggregate results, however, may conceal wide variations in the incidence of gross errors in the results secured from individual samples or groups of samples. It is impracticable to reproduce here the detailed results obtained from each individual sample, but as an approximation to such a tabulation, and in order to avoid the counterbalancing of negative and positive errors which occurs in the compilation of aggregates, the following device is employed: the difference between the number of positives indicated by each method of confirmation and the number of sample portions from which, by any method, coliforms have been isolated, is computed for each sample; all positive differences are summed to give a total which is designated as the "positive cumulative error," and all negative differences are likewise summed to give the negative cumulative error. For example, if, through the use of all of the confirmation methods, coliform organisms are isolated from 5 portions of a sample, whereas the crystal violet confirmation method indicates 7 portions to be positive, the error due to the use of the crystal violet method is recorded as + 2. All such results are added together to give the positive cumulative

TABLE V

Cumulative Errors of Results from 5 Confirmatory Procedures Comparing the Usual Standard Methods "Completed Test" (SMC) with Various Liquid Confirmatory Procedures (BG, CV, F, FR) as Employed in Practice, viz., Presence of Gas Alone Is Considered to Constitute Confirmation

		Confirmatory Procedures									Total Coliforms Isolated
		SMC	BG		CV		F		FR		by One or
No. of Samples	Reported by	—	+	—	+	—	+	—	+	—	More of 5 Methods
945	19 laboratories	365	105	166	214	145	292	180	351	50	2,684
		13.6	3.9	6.2	8.0	5.4	10.9	6.7	13.1	1.9	100%
158	Quebec	134	5	133	41	42	53	46	116	12	524
1,103	20 laboratories	499	110	299	255	187	345	226	467	62	3,208
110	Ontario (Tor.)	5	49	0	48	2	58	1	64	0	420
1,213	21 laboratories	504	159	299	303	189	403	227	531	62	3,628
		13.9	4.4	8.2	8.4	5.2	11.1	6.3	14.6	1.7	100%

error of the crystal violet method. It is to be noted that only the presumptives of the selective media enter into this comparison for they alone are usually available in practice. It is also to be observed that since the usual "completed test," unlike the selective methods, does not record non-confirming lactose broth presumptives as positives, there can be no positive cumulative error referable to the usual "completed test."

Table V shows the cumulative errors of the results obtained, by each confirmatory method, from the 1,213 samples. Because of the large proportional contributions of the Ontario (Toronto) and Quebec laboratories and because their results occupy opposite and rather extreme positions in the series, they are tabulated separately.

In terms of these cumulative errors, two essential requirements of any presumptive confirmatory procedure, intended to replace the usual "completed test," are: (1) Its positive cumulative error must be very small compared with the total number of sample portions shown to contain coliform organisms; otherwise too many water supplies will be unjustly suspected. (2) Its negative cumulative error must be as small as possible and, preferably, not greater than that of the usual "completed test"; otherwise too many instances of contamination may be overlooked.

Keeping in mind these two requirements, a rapid survey of the first series of figures of Table V shows at once that, for the first group of 19 laboratories, the confirmation method of choice is that which employs brilliant green bile. Its positive error is only 3.9 per cent of all of the coliform isolations, and its negative error of 6.2 per cent is less than half that of the usual "completed test." The use of certain of the other methods leads to even smaller negative errors but, on the other hand, introduces larger positive errors.

Quebec's brilliant green bile negative error is about the same as its usual "completed test" negative error, and its positive error is 5, or less than 1.0 per cent.

Ontario (Tor.), however, seldom encountered failure in its use of the usual "completed test" (its negative error is less than 1.0 per cent, compared with

TABLE VI

Cumulative Errors of Results from 5 Confirmatory Procedures as Percentages of Total of Sample Portions Containing Coliform Organisms (Isolated by 1 or More of 5 Methods)

Waters Type	*Number of Samples*	*Number of Laboratories*	*SMC* —	*BG* +	*BG* —	*CV* +	*CV* —	*F* +	*F* —	*FR* +	*FR* —	*Total Coliforms Isolated by 1 or More of 5 Methods*
All types (includes 60 unclassified)	1,213	21	13.9	4.4	8.2	8.4	5.2	11.1	6.3	14.6	1.7	3,628
Streams	150	15	11.5	3.5	4.4	5.0	2.5	4.9	3.3	8.6	0.4	793
Unfinished	193	9	20.7	3.4	7.6	10.3	5.9	18.0	3.8	20.9	1.9	473
Finished	306	13	29.2	9.4	25.5	49.1	19.8	108.5	12.3	76.4	17.0	106
Springs	69	11	23.1	6.9	18.8	11.5	6.9	9.2	9.6	20.0	2.3	260
Wells	308	16	10.0	3.8	7.8	5.1	4.7	4.8	7.6	9.7	1.6	1,595
Lakes	110	5	16.6	1.3	7.6	4.9	8.5	6.7	5.8	9.0	0.0	223
Sea Water	6	2	17.1	2.9	2.9	0.0	2.9	0.0	5.7	5.7	2.9	35
Reservoirs and pools	11	1	11.4	5.7	11.4	0.0	17.2	31.4	2.9	31.4	0.0	35

TABLE VII

Cumulative Errors of Results Obtained by Collaborating Laboratories, from 5 Confirmatory Procedures, in Percentage of Total Number of Sample Portions Shown to Contain Coliform Organisms

			Confirmatory Procedures								
				BG		CV		F		FR	
Laboratory	No. of Samples	No. of Presump.	SMC —	+	—	+	—	+	—	+	—
Arizona	14	48	14.6	4.2	10.4	0.0	16.6	22.9	4.2	22.9	0.0
Connecticut	27	90	14.4	12.2	7.8	22.2	1.1	14.4	5.6	23.3	0.0
California	14	93	0.0	0.0	0.0	0.0	10.8	0.0	10.8	0.0	0.0
Georgia	52	94	19.2	11.7	4.3	24.5	3.2	14.9	6.4	50.0	2.1
Indiana	47	455	5.9	2.9	4.8	3.3	3.1	1.5	8.4	3.5	0.9
Kansas	83	205	7.8	3.4	8.8	7.3	7.8	16.1	4.4	17.6	1.0
Minnesota	78	70	10.0	8.6	7.2	21.4	2.9	53.0	2.9	18.6	1.4
New Jersey	37	193	1.6	0.5	1.6	0.5	1.6	0.5	3.1	0.5	1.6
New York	90	326	21.2	5.5	10.1	7.1	7.7	2.8	14.7	17.2	2.1
Ohio	31	134	21.6	2.2	7.5	6.0	3.7	3.0	16.4	4.5	7.5
S. Dakota	23	61	0.0	3.3	11.5	0.0	11.5	14.8	4.9	9.8	9.8
Ontario—Tor.	110	420	1.2	11.7	0.0	11.4	0.5	13.8	0.2	15.2	0.0
" —Ft. W.	15	17	70.6	17.6	23.8	47.0	17.6	100.0	0.0	105.9	5.9
" —N. B.	5	35	22.8	0.0	5.7	0.0	0.0	0.0	2.9	5.7	5.7
Quebec	148	524	25.6	1.0	25.4	7.8	8.0	10.1	8.8	22.2	2.3
Birmingham, Ala	47	208	16.4	2.9	4.8	9.1	2.9	7.2	1.9	18.8	0.5
Chicago, Ill.	129	176	15.9	1.7	5.7	4.5	11.4	12.5	8.0	8.5	1.1
Decatur, Ala.	19	74	0.0	2.7	0.0	0.0	0.0	1.4	1.4	8.1	1.4
Indianapolis, Ind.	70	117	8.6	3.4	8.6	6.0	5.1	21.4	2.6	15.4	3.4
Minneapolis, Minn.	56	58	24.2	6.9	6.9	5.2	10.3	25.9	3.5	46.5	0.0
St. Louis, Mo. .	118	230	30.4	3.9	5.2	21.3	4.8	25.6	1.7	5.6	1.7
	1,213	3,628	332.0	106.3	160.1	204.6	130.6	361.8	112.8	419.8	48.4
Average			15.8	5.1	7.6	9.7	6.2	17.2	5.4	20.0	2.3

that of 15.5 per cent for the total of the other 20 laboratories). Its brilliant green bile negative error is 0.0 per cent and its positive error 11.7 per cent.

The cumulative errors, in percentages of the total numbers of coliform organisms isolated by all procedures from the different types of waters (when these were clearly designated) are shown in Table VI.

Particular attention is directed to the results obtained from the "finished" waters, which include final treated or filtered-treated waters. It is evident that the usual "completed test" failed to detect the organisms in about 29 per cent of the presumptives in which they were present. Again the brilliant green bile results are quite favorable: although the positive error is 9.4 per cent, the negative error is only 25.5 per cent, 3.7 less than that of the "completed test." The positive errors due to the use of crystal violet, fuchsin, and formate ricinoleate broths, with this class of water, are rather striking.

Table VII shows the cumulative errors, positive and negative, due to the use of each of the 5 confirmatory procedures, of the results from each laboratory, in terms of percentages of the total numbers of sample portions from which, by any method, coliform organisms were isolated. The average of these percentages is also shown.

It will be observed that the results of the great majority of the laboratories follow the same general trend: the brilliant green bile positive error is not excessive and its negative error is less

than the usual "completed test" error. Although the crystal violet negative error is often less than that of the brilliant green bile, its positive error is usually greater, and often considerably greater (especially when this medium is employed with unfinished and finished waters); the fuchsin broth errors are irregular often more pronounced than are those of the other 3 methods; and the formate ricinoleate positive error is nearly always excessive, although its negative error is usually rather small. On the whole, the results indicate that the brilliant green bile method proved as a rule the best of the 5 methods; more frequently than did any of the other methods, it yielded a number of positives approximating the number of sample portions from which, by some method, coliform organisms were isolated. The results reported by the purification plants, as a group, particularly favor the choice of the brilliant green bile method.

DISCREPANCIES BETWEEN RESULTS FROM BORDER-LINE SAMPLES

Since the border-line samples, or those samples from which was obtained some indication of the presence of small numbers of coliform organisms, are of special interest, Table VIII has been prepared. This table shows, first, all the discrepancies which occurred in the results obtained by means of the different confirmatory methods when, although the sample yielded lactose broth presumptives, one or more of the methods gave an indication of the absence of coliform organisms from the sample.

It is to be observed, in this table, that 283 treated, filtered, or filtered-treated waters, which yielded lactose broth presumptives, were found by all methods to contain no coliform organisms. But the brilliant green bile method of confirmation (gas only signifying the presence of the organism) gave, 3 times, a false indication of 2 coliforms per 100 c.c.; it never, however, gave a false indication of "more than 2" coliforms per 100 c.c. of sample. The crystal violet method gave a false indication of 2 per 100 c.c. 17 times, and of more than 2 per 100 c.c. 6 times. The fuchsin broth and formate ricinoleate broth gave many false indications of both types. Considering now all classes of waters and excluding only the Ontario (Tor.) results, of 391 samples from

TABLE VIII

Certain Discrepancies in Results Obtained by Various Confirmatory Methods When One or More Methods Indicated Absence of Coliform Organisms from Sample

Type of Samples and Number of Laboratories Reporting	Coliform Density by All Methods=0 per 100 c.c.									Coliform Density by All Methods=>2 per 100 c.c.					
	Number of Samples with LBP Presumptives	Coliforms=2/100 c.c. by Gas Only in				Coliforms=>2/100 c.c. by Gas Only in				Number of Samples with LBP Presumptives	Coliforms=0 per 100 c.c. by Gas Only in				
		BG	CV	F	FR	BG	CV	F	FR		BG	CV	F	FR	SMC Completed
T, F or FT waters 13 laboratories	283	3	17	33	16	0	6	19	25	92	4	1	1	0	8
Natural waters 10 laboratories	108	7	14	15	16	1	11	6	10	271	10	3	7	0	10
Totals	391	10	31	48	32	1	17	25	35	363	14	4	8	0	18
		2.6%													
Natural waters Ontario—Tor.	45	8	7	8	5	6	6	7	10	52	0	0	0	0	0
Grand total	436	18	38	56	37	7	23	32	45	415	14	4	8	0	18

which no coliform organisms were isolated, 10, or only 2.6 per cent, were indicated by brilliant green bile to contain 2 per 100 c.c., and only one sample to contain more than 2 per 100 c.c. The Ontario (Tor.) results are quite different: the corresponding proportions are 17.8 per cent and 13.3 per cent.

On the other hand, the second section of Table VIII shows that when the coliform density was greater than 2 per 100 c.c., of 92 treated, filtered, or filtered-treated waters, the brilliant green bile failed to indicate the presence of coliforms in 4; but it is to be noted that the "completed test" failed in 8. Again considering all classes of water and again excepting the Ontario (Tor.) results, brilliant green bile evidently failed to indicate the presence of coliforms, in samples which contained more than 2 per 100 c.c., in 14 of 363 samples, or 3.9 per cent, whereas the "completed test" similarly failed in 18 samples, or 5.0 per cent. Ontario (Tor.) reported no failures, by any method, of this character. It may be noted, in this connection, that the Minnesota laboratory examined a number of samples of Minneapolis tap water (filtered-treated), testing 10 portions of *100 c.c.* of each sample; 68 of these samples yielded lactose broth presumptives. From 8 of the 402 presumptives coliform organisms were isolated by the use of all methods combined. The usual "completed test" gave 6 positives, and the brilliant green bile 12 gas positives, from which 7 isolations were obtained.

It is evident, therefore, from this study of the results secured from border-line samples that in general the brilliant green bile method was superior to the other selective procedures for the confirmation of lactose broth presumptives from such samples. Furthermore, the results indicate that there was very little difference between the results obtained by the brilliant green bile method and those obtained from the usual "completed test": the rapid method gave a few false positives, but a smaller number of false negatives than did the more arduous procedure.

It must be concluded from the results of this study of the 5 confirmatory procedures that whether viewed from the standpoint of the comparative aggregate results, the comparative individual results expressed in terms of "cumulative errors," or the comparative results obtained from border-line samples, the brilliant green bile appears to be the best of the 4 liquid selective media for use in the simplified "confirmed" procedure. To be sure, groups of results reported by some collaborating laboratories may not entirely support this conclusion; a rather remarkable feature of the series of reported results, however, is that so many *do* support it. Likewise remarkable is the agreement of so many laboratories, as indicated by their reported results, that the brilliant green bile "confirmed test" not only suffered very little in comparison with the usual "completed test," but very often proved to be the more satisfactory of the two. It has already been shown that the number of isolations of coliform organisms secured from the brilliant green bile presumptives compared very favorably with the number of isolations from the lactose broth presumptives (98.4 per cent of the latter). Evidently the inclusion in the last edition of *Standard Methods,* of this alternative method for the "completed test" was, to judge from these figures, quite justified. Even when applied to the examination of finished waters, the 1,175 lactose broth presumptives yielded 75 positives by the "completed test," 89 gas positives by the brilliant green bile method, and 74 isolations from these brilliant green bile presumptives, whereas all methods combined permitted 106 isolations.

Obviously these figures suggest that the brilliant green bile method of con-

firmation (followed, if required, by attempted isolation of coliform organisms from the brilliant green bile presumptives) might advantageously be substituted for the usual "completed test" even in the examination of finished waters.

II Comparison of the Two Primary Media: Lactose Broth and Fuchsin Broth

It will be remembered that, for this comparison, usually 10 portions of sample were planted in primary lactose broth and 10 portions in fuchsin broth, and any presumptives which appeared in either medium were submitted to the "completed test"; in addition, the lactose broth presumptives were also confirmed by the 4 selective liquid media methods. The number of samples examined in this manner numbered 890.

The results obtained from these 2 methods of examination are shown, in the aggregate (together with the results of confirmation of the lactose broth presumptives from the same samples by the use of the 4 selective liquid media) in Table IX.

It is evident, from the second column of this table, that the number of fuchsin broth presumptives was 69.1 per cent of the number of lactose broth presumptives, a reduction of 31 per cent. On the other hand, when complete confirmation was practised, coliform organisms were isolated from only 70.5 per cent of the fuchsin broth presumptives; the resulting number of isolations, however, was 2,048, or 97.1 per cent of the number of isolations obtained by the use of the usual "completed test." Evidently these results are more favorable than those which reported relative productivity tests of fuchsin broth with pure cultures would lead one to expect; the inhibition of coliform organisms by this medium appears to be very slight when they are accompanied by the mixed bacterial flora of natural waters. This fuchsin broth primary method, however, requires the employment of the "completed test" and since, on the average, the number of presumptives in this series of examinations was reduced by only 31 per cent, the advantage of substitution of the fuchsin broth for the lactose broth in the *Standard Method* was not very marked.

It was hoped that the fuchsin broth might prove satisfactory in a direct presumptive method which would not require confirmation of presumptives. But according to Table IX, the fuchsin

Table IX

Results of Examination of 890 Water Samples by 6 Different Procedures

Procedure	Presumptives		Portions from Which Coliforms Were Isolated *		
	No.	*Per cent of LBP Presumptives*	*No.*	*Per cent of Positive Presumptives*	*Per cent of LBP+SMC Positives (2,110)*
Fuchsin Broth (+SMC)	2,903	69.1	2,048(4)	70.5	97.06
LBP (+SMC)	4,204	100.0	*2,110*	50.2	100.00
" +BG (+SMC)	2,384	56.7	2,079(3)	87.2	98.53
" +CV (+SMC)	2,592	61.7	2,109(3)	81.4	99.95
" +F (+SMC)	2,650	63.1	2,107(6)	79.5	99.86
" +FR (+SMC)	2,894(5)	68.9	2,168(6)	74.9	102.75

Note: The figures in parentheses (which are included in the adjoining totals) indicate the number of missing tubes, incomplete tests, etc., considered positive in order to avoid loss of remaining data obtained from certain samples.

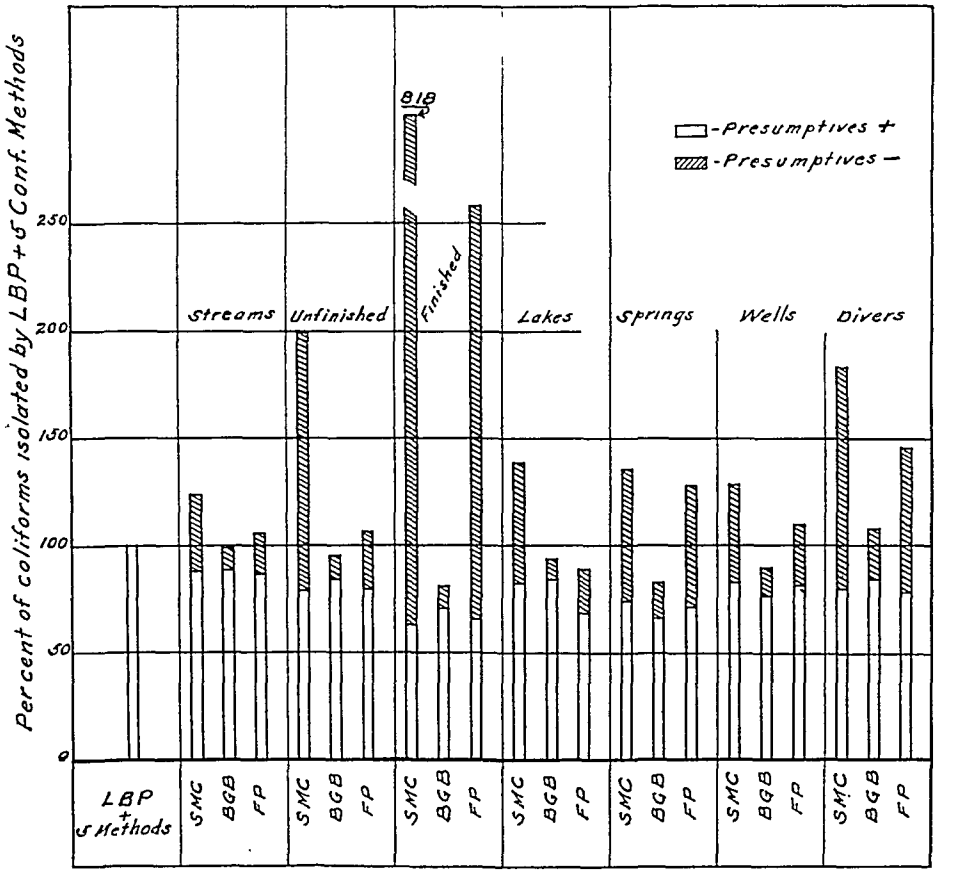
* The lactose broth presumptives from which coliform organisms were isolated by 1 or more of 5 confirmatory methods, numbered 2,545.

TABLE X

Comparison of Results of Examination of 890 Water Samples by 4 Coliform Procedures

		1	2		3		4	
			Usual Completed Test		Brilliant Green Bile Confirmatory Procedure		Fuchsin Broth Primary	
Waters	Number of Samples with Presumptives	Number of Isolations by Lactose Broth Primary and 5 Confirmatory Procedures	LBP Presump. Per cent of Column 1	Isolations Per cent of Column 1	BG Presump. Per cent of Column 1	Isolations Per cent of Column 1	FP Presump. Per cent of Column 1	Isolations Per cent of Column 1
Streams	140	728	124	88	99	88	106	86
Unfinished	187	462	198	79	96	85	107	81
Finished	192	81	818	64	81	72	258	66
Lakes	110	223	139	83	94	85	89	69
Springs	61	231	136	75	83	67	128	72
Wells	175	749	129	84	90	77	110	82
Divers	25	71	183	83	108	86	146	79
Total	890							

FIGURE I—Comparison of Results of Examination of 890 Water Samples by 4 Coliform Procedures



broth presumptives numbered 2,903, whereas the number of portions containing coliforms, as revealed by lactose broth plus the use of 5 confirmatory methods, was only 2,545. Apparently the fuchsin broth primary presumptives included a considerable number of false positives, as was also found to be the case when it was employed as a confirmatory medium.

Since the great majority of the collaborating laboratories reported results similar to the aggregate results described above, no attempt is made to describe the individual results obtained with the fuchsin broth. Apparently it yields very satisfactory results with some waters, but proves unsatisfactory for the examination of others.

Table X and Figure I present a comparison of the results obtained from 890 samples, classified according to type of water, employing 4 methods of examination: the lactose broth plus 5 confirmatory methods, the results of which are taken as a basis for the comparison; the *Standard Methods* completed test, the lactose broth with brilliant green bile confirmation, and the fuchsin broth primary method. The figure shows very clearly that the method which yields the most satisfactory results is that which employs lactose broth with brilliant green bile confirmation, taking gas alone in the latter to indicate presence of coliform organisms. It shows also, however, that if confirmation is for any reason required, this method yields a number of isolations which is usually about the same as, or greater than that obtained by attempted isolation from the lactose broth presumptives.

DISCUSSION

For many years past, the *Standard Methods* procedure for the detection of the presence of coliform organisms in water has specified primary planting of the sample into lactose broth with the view evidently to securing, through the use of a simple, non-inhibitive medium, the multiplication of as many as possible of the various types of coliform organisms which may be contained in water. The propriety of this policy will not be discussed here, except to note that, as measured by the continued reduction of enteric disease incidence on this continent, no small measure of success has followed its adoption; and that, in view of the recent suspicion cast upon the adequacy of the present *Standard Methods,* because of the occasional occurrence of gastrointestinal infection in communities supplied with water declared upon examination by means of these methods to be safe, disregard of the presence in water of any coliform organism which multiplies in lactose broth, does not appear to be warranted at the present time. It is obvious, however, that if this policy is accepted, every instance of multiplication of coliform organisms in lactose broth presumptives must, if possible, be recognized. In other words, the estimate of the coliform density of a sample must include, in so far as is practicable, every coliform organism, regardless of type or degree of attenuation, which has produced gas in the primary lactose broth.

The " completed test " includes some features which are so speculative and other features so dependent, for their effectiveness, upon the personal element, that it is subject to error, varying according to the aggregate results reported by the laboratories collaborating in the present study from 0.0 per cent to 30.4 per cent of the number of sample portions from which coliform organisms were isolated. It is to be remembered that Ruchhoft and Noble reported a similar error of about 26 per cent when working with Chicago treated water. The " completed test," moreover, is costly—much labor and material are required—and because of

this fact another speculative procedure must be introduced in practice: the choice of one or, at most, of very few of the lactose broth presumptives for confirmation. Whether the presumptive (or presumptives) chosen is or is not one of those which contains coliform organisms, is often the result of chance alone.

Chance and the personal element involved in fishing colonies from an Endo or E.M.B. plate are almost entirely eliminated by the substitution, for the "completed test," of a liquid medium confirmatory method. Such a method is so simple that a minimum of experience on the part of the technician is required. The results are clean-cut, positive or negative. Identical results should practically always be obtained by different workers from the same presumptive. For this test, however, a suitable medium must be employed.

The results of the present study of several liquid confirmatory media indicate that brilliant green bile (2 per cent) will serve, in the great majority of laboratories, as a reliable medium for use in the simpler confirmatory procedure. That its use yields results which in general strike as close or closer to those obtained through the use of several procedures than does the "completed test," has been shown by the comparative additive errors, positive and negative, of the results obtained from the individual samples examined and by a detailed study of the results secured from the important group of "border-line" samples, or samples containing few or no coliforms but from which lactose broth presumptives were secured.

Probably no confirmatory method can be expected to give uniform results throughout the continent. The results reported here indicate variations of bacterial flora in different areas which are sometimes rather striking. Despite the obvious existence of such difficulties in the way of the choice of a confirmatory method, the brilliant green bile procedure is reported, with surprising accord, to constitute the most satisfactory of all the procedures studied. The presumptives of many finished waters, a group notoriously difficult of confirmation, appear to yield, through the use of the brilliant green bile "confirmed test," results nearly as satisfactory as those secured by the employment of a "completed test."

Furthermore, practically all the collaborating laboratories reported about the same numbers of isolations obtained from the brilliant green bile presumptives as were obtained from the lactose broth presumptives. As a consequence, when the simpler confirmatory method is used, there is always available, in special cases, the "complete" confirmation of the bile presumptives which usually yields results comparable to those obtained by attempted isolation from the lactose broth presumptives.

It may be concluded, therefore, that the results of this study indicate that the brilliant green bile confirmatory method is unquestionably the most generally satisfactory of the selective media confirmatory procedures described in the last edition of *Standard Methods of Water Analysis* and that it yields results which, with the possible exception of those obtained from finished waters, are usually more accurate than are those secured by the use of the "completed test." The utility of its application to the confirmation of presumptives from finished waters is still an open question. The results of "complete" confirmation of the brilliant green bile presumptives here reported, however, whether obtained from finished or other waters, serve to justify the inclusion in the last edition of *Standard Methods* of this alternative method of performing the "completed test." Evidently much time and labor usually may be saved by employing

the rapid brilliant green bile confirmatory test and accepting, at least for the moment, the implications furnished by the results; rarely, it appears, will this practice lead to an underestimate of the coliform density of a water; and if the density indicated is considered excessive, complete confirmation of the brilliant green bile presumptives may be expected to yield quite as many isolations as will complete confirmation from lactose broth.

It may be concluded also, from the results of this study, that fuchsin broth, when employed as a direct presumptive primary medium, very often yields an excessive number of presumptives, but when followed by "complete" confirmation, the number of isolations of coliform organisms closely approaches that secured through the use of the lactose broth primary and the "completed test." The proportion of isolations, however, only 70.5 per cent of the fuchsin broth presumptives (compared with that of 52.2 per cent of the lactose broth presumptives), is not sufficiently promising to warrant its general adoption, despite the fact that, when employed with some waters, the results are very satisfactory.

SUMMARY

Twenty-one laboratories situated in the United States and Canada have collaborated in a study of 6 different methods for the detection of the presence of coliform organisms in water. A total of 1,213 samples of water from which lactose broth presumptives were obtained, was examined, employing 5 different methods of confirmation of these presumptives: the "completed test" of *Standard Methods of Water Analysis*, and 4 liquid media methods employing, respectively, brilliant green bile, crystal violet, fuchsin, and formate ricinoleate broths. Fuchsin broth was also used as a primary medium in the examination of 890 of the above samples.

The results reported by the collaborating laboratories indicated the brilliant green bile confirmatory method to be the most generally satisfactory of the selective procedures. The results also indicated that the brilliant green bile method compared very favorably with the usual *Standard Methods* "completed test" and, for the examination of most waters, might advantageously replace it. The results obtained from finished waters suggest the use with such waters, of the alternative "completed test" procedure of *Standard Methods:* the employment of the brilliant green bile confirmatory method, followed by attempted isolation of coliform organisms from presumptives of this medium, instead of the "completed test" of lactose broth presumptives, in order to eliminate much of the labor involved in the latter procedure.

The results obtained from the use of fuchsin broth, whether as a direct presumptive medium or as a primary medium replacing lactose broth, were not so generally satisfactory as those secured through the use of lactose broth followed by the brilliant green bile "confirmed test" or "completed test."

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Milk-Borne Streptococcic Infections*

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DETAILED clinical and epidemiological observations were made by members of the staff of the Division of Communicable Diseases of the New York State Department of Health in 7 milk-borne epidemics of streptococcus infection comprising 1,529 cases and 24 deaths occurring in the 3 year period 1934–1936. Three of the epidemics studied, consisting of 806 cases and 16 deaths, were classified clinically as scarlet fever, and 4 epidemics, consisting of 723 cases and 8 deaths, were classified as septic sore throat. An analysis was made of data obtained during the investigation of these 7 epidemics, with special reference to the clinical and immunological characteristics of the streptococcus infections observed.

All the epidemics occurred in villages of less than 6,000 population, and in each instance the incriminated milk supply was one of raw milk or cream. The generally accepted identifying characteristics of milk-borne epidemics were observed in each outbreak. All the epidemics were explosive in character; in each outbreak elimination or pasteurization of the incriminated milk supply was followed by a marked decline in case incidence. As shown in Table I, each epidemic was charac-

TABLE I

Summaries of 3 Milk-borne Scarlet Fever Epidemics and 4 Milk-borne Septic Sore Throat Epidemics, New York State, 1934–1936

Type and Location of Epidemic	*Number of Cases*	*Number of Deaths*	*Per Cent of Cases 15 Years of Age or Over*	*Cases per 100 Quarts of Milk Sold Daily by Incriminated Dairy*	*Cases per 100 Quarts of Milk Sold Daily by All Other Dairies*
Scarlet fever					
Owego	532	8	71.4	145.0	5.9
Wellsville	201	6	68.8	27.2	1.1
Red Creek	73	2	69.8	45.0	2.5
Septic sore throat					
Baldwinsville	500	7	75.3	107.1	4.3
Corfu	112	0	75.0	88.7	8.2
Dryden	56	1	87.5	62.4	1.9
Waterloo	55	0	70.7	51.0	0.3

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

terized by an age distribution typical of milk-borne outbreaks, a higher proportion of cases occurring among adults than among children. An overwhelming majority of the cases in each epidemic occurred among patrons of a single dairy as shown in Table I by case rates per 100 quarts of milk among customers of the implicated dairy and among customers of all other dairies.

Efforts to determine the source of contamination of the milk supply resulted in the discovery of acute mastitis in members of the producing herds in 6 of the 7 epidemics. The organism isolated from milk produced by the cows suffering from mastitis in each instance was found to be a hemolytic streptococcus of the type usually associated with human infection (Lancefield's Group A) [1] and was indistinguishable from the organism isolated from throat cultures obtained from typical cases observed in the same epidemic. In 5 of the 7 outbreaks, acute cases, or recent illnesses, strongly suggestive of hemolytic streptococcus infection were found to have occurred among the milkers or milk handlers associated with the producing herds, the date of onset of the infection in the milk handler always preceding the development of acute mastitis in the cow. In the one epidemic where examination of the producing herd revealed no acute mastitis, it was found that the milk had been bottled and capped by hand by a person suffering from an acute sore throat.

Evidence of transmission of streptococcus infection by personal contact in milk-borne outbreaks is frequently obscure. This lack of evidence is probably due to the almost universal exposure of members of households in which the contaminated milk supply is used, resulting in the simultaneous infection of nearly all susceptible persons in the household. In 2 of the epidemics studied, one of scarlet fever and one of septic sore throat, there was a considerable number of instances in which the original case in the family was a worker in a factory where the incriminated milk was regularly served but whose household contacts had no known exposure to this milk supply. In these families there was evidence of transmission of infection by direct personal contact similar to that observed in epidemics of scarlet fever in which dissemination appeared to be solely by personal contact. A comparison of the secondary attack rates in such a group in the Owego scarlet fever epidemic, with the attack rates observed in a contact epidemic of scarlet fever in Binghamton, New York, is shown in Table II. A secondary attack rate of 20 per cent was observed among 50 such household contacts in the Baldwinsville epi-

TABLE II

Secondary Attack Rates by Age Among Household Contacts (1) in a Contact Epidemic of Scarlet Fever and (2) in a Milk-borne Epidemic of Scarlet Fever Where the Primary Case Occurred in a Consumer of the Incriminated Milk Supply But Where the Members of the Household Had Not Consumed the Incriminated Milk

	Contact Epidemic Binghamton		*Milk-borne Epidemic Owego*		*Secondary Attack Rate Per Cent*	
Age Group	*Persons Exposed*	*Number of Cases*	*Persons Exposed*	*Number of Cases*	*Contact Epidemic*	*Milk-borne Epidemic*
0–14	465	93	73	10	20.0	13.7
15 and over	773	41	192	14	5.3	7.3
Total	1,238	134	265	24	10.8	9.0

demic of septic sore throat. These findings suggest that streptococcus infections occurring in milk-borne epidemics are as readily transmitted by direct contact as are similar infections seen as sporadic cases or in epidemics in which there is no evidence of a common source of infection.

CLINICAL CHARACTERISTICS

The clinical manifestations of the illnesses observed in the various outbreaks were strikingly similar with the exception of the presence or absence of a characteristic scarlet fever rash and desquamation. Almost without exception the patients suffered from sore throat with fever of from 100° F. to 104° F., general malaise, and varying degrees of prostration. The throat was almost invariably red and frequently edematous. A punctate rash was frequently seen on the palate both in epidemics classified as scarlet fever and as septic sore throat. The tonsils were red and swollen and frequently covered with exudate. The anterior cervical lymph glands were almost invariably enlarged and tender. In the 3 epidemics classified as scarlet fever, a typical scarlet fever rash was observed in approximately 60 per cent of the cases, but a significantly higher incidence of the rash was noted in children than in adults. Eighty per cent of the scarlet fever patients under 15 years of age developed a rash as compared with 50 per cent of those 15 years of age or over. In almost all cases the rash was followed by desquamation. Those patients developing a rash were clinically indistinguishable from sporadic cases of scarlet fever or cases of scarlet fever observed in contact epidemics. Cases in which no rash was observed occurring in epidemics classified as scarlet fever were clinically indistinguishable from cases occurring in the epidemics of septic sore throat. Scarlet fever cases without rash and cases of septic sore throat were also clinically indistinguishable from the type of case frequently seen in the absence of any epidemic and usually diagnosed as severe tonsillitis.

COMPLICATIONS

Approximately 25 per cent of the patients seen during each epidemic developed one or more serious complications. The complications most frequently encountered were: arthritis and rheumatism, otitis media, mastoiditis, quinsy, cervical abscess, nephritis, pneumonia, sinusitis, and erysipelas. The same complications were observed

TABLE III

Complications Observed in Milk-borne Epidemics of Septic Sore Throat in Baldwinsville and Dryden and of Scarlet Fever in Owego and Wellsville

	Scarlet Fever		*Septic Sore Throat*	
Complications	*Number of Cases*	*Per cent*	*Number of Cases*	*Per cent*
Arthritis and rheumatism	59	8.2	69	13.1
Otitis media and mastoiditis	48	6.6	50	9.5
Quinsy	26	3.6	48	9.1
Cervical abscess	2	0.3	15	2.8
Nephritis	11	1.5	6	1.1
Pneumonia	6	0.8	5	1.0
Sinusitis	24	3.3	4	0.8
Erysipelas	11	1.5	6	1.1
Number of cases observed	723		526	
Cases with one or more complications	180	24.9	130	24.7

in all 7 epidemics and, as shown in Table III, these complications occurred with approximately the same frequency in scarlet fever and septic sore throat outbreaks.

There were 16 deaths among the 806 cases of scarlet fever, and 8 deaths among the 723 cases of septic sore throat. Eleven of the 16 deaths in scarlet fever epidemics occurred during the 1st week of the illness, 1 in the 2nd week and 4, 4 weeks or more after the onset of the original infection. Of the 8 deaths in septic sore throat outbreaks, only 2 occurred in the 1st week of the illness, 1 in the 2nd, 1 in the 3rd, and 4 occurred 4 weeks or more after the onset of the primary infection. Complications were given as contributory causes of death in 12 of the 16 deaths occurring in scarlet fever outbreaks. Of the 8 deaths occurring in septic sore throat epidemics, all were among individuals suffering from a complication of the original infection.

SUSCEPTIBILITY

The occurrence of relatively large numbers of cases of streptococcus infection within short periods of time and in limited areas presented unusual opportunities to study the various factors which might be expected to influence susceptibility to infection. There was no evidence of difference in susceptibility to infection by sex. The age distribution of cases corresponded closely to the age distribution of the population of the community in which the particular epidemic occurred, indicating no difference in susceptibility according to age, either in scarlet fever or in septic sore throat epidemics.

The quantity of infectious material consumed, however, did influence the probability of infection. In 4 epidemics, a milk census was taken, either of the entire village in which the epidemic occurred or in a random sample of the population of that village, and data were obtained concerning the regular and supplementary milk supplies of the family, together with information as to the amount of milk consumed per day by each individual. Table IV shows attack rates according to quantity of milk consumed among patrons of the incriminated dairy in the Owego scarlet fever epidemic. The attack rates varied directly with the amount of milk consumed irrespective of age of the persons exposed. Milk census data in the other epidemics studied, both those of scarlet fever and of septic sore throat, showed the same increased probability of infection with increased milk consumption.

It has been generally assumed that scarlet fever produces subsequent immunity to infection in a considerable proportion of those attacked, but it has not been thought likely that scarlet fever produces immunity to septic sore throat. The effect of a previous attack of scarlet fever upon susceptibility to scarlet fever or septic sore throat was

TABLE IV

Attack Rates According to Age and Quantity of Milk Consumed per Day Among Regular Consumers of the Incriminated Milk—Owego Scarlet Fever Epidemic

	0–14		15 and Over		Attack Rate Per cent	
Average Daily Milk Consumption	*Persons Exposed*	*Cases*	*Persons Exposed*	*Cases*	*0–14*	*15 and Over*
None	17	2	90	15	11.8	16.7
1–7 oz.	29	8	227	57	27.6	25.1
8 oz. and over	203	84	230	95	41.4	41.3
Total	249	94	547	167	37.8	30.5

TABLE V

Attack Rates Among Persons Living in Households Where One or More Cases Occurred According to Age and History of Previous Scarlet Fever in Milk-borne Epidemics of Scarlet Fever in Owego, Wellsville and Red Creek and of Septic Sore Throat in Dryden and Waterloo

	Scarlet Fever Epidemics						Septic Sore Throat Epidemics					
	Previous Scarlet Fever		No Previous Scarlet Fever		Attack Rate Per cent		Previous Scarlet Fever		No Previous Scarlet Fever		Attack Rate Per cent	
Age Group	Number of Persons	Cases	Number of Persons	Cases	Previous Scarlet Fever	No Previous Scarlet Fever	Number of Persons	Cases	Number of Persons	Cases	Previous Scarlet Fever	No Previous Scarlet Fever
0–14	36	9	459	223	25.0	48.6	9	5	43	16	55.5	37.2
15 and over	263	101	1,000	434	38.4	43.4	45	20	129	59	44.4	45.7
Total	299	110	1,459	657	36.8	45.0	54	25	172	75	46.3	43.6

studied by means of household attack rates. Attack rates among persons living in households in which one or more cases occurred are given in Table V by age and according to history of previous scarlet fever for 3 epidemics of scarlet fever and 2 of septic sore throat. A previous attack of a streptococcus infection, diagnosed scarlet fever, apparently produced little or no immunity to subsequent infection with the hemolytic streptococcus associated with either milk-borne scarlet fever or septic sore throat epidemics. Scarlet fever patients who gave a history of a previous attack were apparently as severely ill as were those who denied having previously suffered from scarlet fever, case fatality rates and the incidence of complications being the same in the two groups. The only difference between these two groups appeared to be the proportion of cases in which a rash was observed. Less than 30 per cent of the patients previously attacked developed a rash, while nearly 65 per cent of those with no history of scarlet fever developed a rash.

It has been repeatedly demonstrated that an attack of scarlet fever usually results in reduced skin sensitivity to the toxin produced by the infecting hemolytic streptococcus. From 4 to 8 weeks after the peak of 2 of the scarlet

TABLE VI

Per cent Negative Skin Sensitivity Tests According to Age and History of Attack During the Milk-borne Epidemics of Scarlet Fever in Owego and Wellsville and of Septic Sore Throat in Baldwinsville and Corfu*

	Scarlet Fever Epidemics						Septic Sore Throat Epidemics					
	Ill		Not Ill		Per cent Negative		Ill		Not Ill		Per cent Negative	
Age Group	Number Tested	Number Negative	Number Tested	Number Negative	Ill	Not Ill	Number Tested	Number Negative	Number Tested	Number Negative	Ill	Not Ill
0–14	112	82	1,052	361	73.2	34.3	121	50	412	145	41.3	35.2
15 and over	164	142	410	193	86.6	47.1	116	61	190	100	52.6	52.6
Total	276	224	1,462	554	81.2	37.9	237	111	602	245	46.8	40.7

* Strain New York 5.

TABLE VII

Per cent Negative Skin Sensitivity Tests According to Age and History of Scarlet Fever in Various New York State Communities, 1934–1937*

Age Group	History of Scarlet Fever †		No History of Scarlet Fever		Per cent Negative	
	Number Tested	Number Negative	Number Tested	Number Negative	History of Scarlet Fever	No History of Scarlet Fever
0– 4	...	...	132	30		22.7
5– 9	232	162	2,816	882	69.8	31.3
10–14	284	216	2,713	1,194	76.0	44.0
15–19	83	66	751	351	79.5	46.7
20–29	23	20	139	62	87.0	44.6
30–39	16	14	62	30	87.5	48.4
40–49	13	13	32	21	100.0	65.6
50 and over	17	15	31	24	88.2	77.4
Total	668	506	6,676	2,594	75.7	38.8

* Strain New York 5

† Exclusive of cases of milk-borne epidemics

fever and 2 of the septic sore throat outbreaks, tests of skin sensitivity to a standard hemolytic streptococcus toxin (Strain New York 5) were made, both in individuals who had suffered an attack during the epidemic and in a comparable group who had not been ill. The results of these tests according to history of illness are given in Table VI.

The proportion of negative skin tests in the group who had recently recovered from scarlet fever was approximately twice that observed in the group tested in the same community who had not been ill during the epidemic. Among scarlet fever patients equally high percentages of negative tests were observed in those who did not develop a rash and in those who had a typical scarlet fever rash. Among those tested fol-

TABLE VIII

Per cent Positive Skin Sensitivity Tests by Age Among Persons Tested in New York State, 1934–1937, and Per cent of Cases with Rash Among Scarlet Fever Patients in Milk-borne Epidemics in Owego, Wellsville and Red Creek*

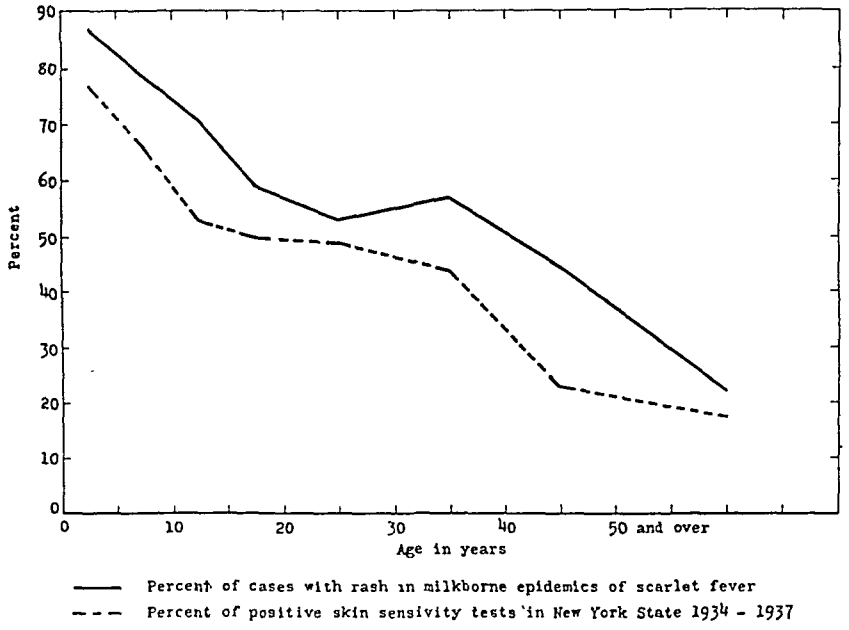
Age Group	Skin Sensitivity Tests † New York State, 1934–1937			Scarlet Fever Cases in Milk-borne Epidemics According to Rash		
	Number Tested	Number Positive	Per cent Positive	Number of Cases	Number with Rash	Per cent with Rash
0– 4	135	104	77.0	61	53	86.9
5– 9	3,080	2,030	65.9	97	76	78.4
10–14	3,046	1,611	52.9	75	53	70.7
15–19	842	422	50.1	93	55	59.1
20–29	167	82	49.1	199	105	52.8
30–39	82	36	43.9	111	63	56.8
40–49	48	11	22.9	79	35	44.3
50 and over	51	9	17.6	72	16	22.2
Total	7,451	4,305	57.8	787	456	57.9

* Strain New York 5

† Exclusive of cases of milk-borne epidemics

FIGURE I

Per cent Positive Skin Sensitivity Tests by Age Among 7,451 Persons Tested in New York State 1934–1937, and Per cent of Cases with Rash by Age Among 787 Scarlet Fever Patients in Milk-borne Epidemics in Owego, Wellsville, and Red Creek



lowing an epidemic of septic sore throat, there was no difference between the percentage of negative skin tests among persons who had recently suffered an attack of the infection and those who had not. These observations indicate the development of an immunity to the skin manifestations produced by the toxin of the standard strain of streptococcus in individuals recovered from scarlet fever, but show no evidence of immunity, as measured by skin test, following septic sore throat.

It has frequently been observed that the proportion of persons with negative skin tests increases with increasing age in the general population. During the past 2 years a considerable number of skin tests have been performed in New York State communities where the incidence of scarlet fever was not, and had not recently been high. As seen in Table VII, the proportion of negative skin tests was distinctly higher among persons giving a history of scarlet fever but increased with age regardless of such a history. In the milk-borne epidemics of scarlet fever under consideration a decreased incidence of rash with increasing age was observed which closely paralleled the decrease in skin sensitivity as measured by the skin test in the general population (Table VIII). Figure I shows graphically the percentage of cases with a rash by age in the milk-borne epidemics of scarlet fever studied and the percentage of positive skin tests by age observed in the general population, indicating a positive correlation between sensitivity as measured by the skin test and the development of a rash.

SUMMARY AND CONCLUSIONS

An analysis was made of 1,529 cases of streptococcus infection occurring in 7 epidemics in New York State during

the period 1934–1936. That each outbreak was milk-borne was established beyond a reasonable doubt. The source of contamination of the milk supply in 6 of the 7 epidemics was shown to be a cow suffering from an acute mastitis caused by a hemolytic streptococcus of the type usually associated with human infection (Lancefield's Group A)[1] and there was at least suggestive evidence of a human source of the bovine infection in each instance.

There was evidence in epidemics both of scarlet fever and septic sore throat of transmission by personal contact comparable to that observed in contact epidemics of scarlet fever.

The appearance of a rash was the only distinguishing characteristic between cases in epidemics classified as scarlet fever or as septic sore throat. All other clinical characteristics, including frequency and type of complicating condition, were practically the same.

The effect of various factors which might be expected to influence susceptibility to infection were studied. No evidence of age or sex selection was found. Dosage of the infectious material seemed to be an important factor in determining whether or not a given individual became ill.

A previous attack of scarlet fever seemed to produce little or no immunity to an attack of milk-borne streptococcus infection but did materially lessen the probability of the development of a scarlet fever rash.

The effect of an attack of milk-borne scarlet fever or septic sore throat upon skin sensitivity to standard streptococcus toxin was tested in communities in which epidemics occurred, and a reduced skin sensitivity was observed following milk-borne scarlet fever comparable to that observed after scarlet fever transmitted by contact but no reduction of skin sensitivity was observed following septic sore throat.

Since a previous attack of scarlet fever did not prevent subsequent attacks, but did reduce the incidence of rash, and inasmuch as those persons recovered from scarlet fever showed an increased proportion of negative skin tests, it seems likely that an intradermal test with a standard streptococcus toxin measures susceptibility to the skin manifestations of scarlet fever but fails to indicate susceptibility to other and more important manifestations of the disease. This observation is further supported by the positive correlation between skin sensitivity and incidence of rash by age.

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Public Health Degrees and Certificates Granted in 1936

THE Committee on Professional Education of the American Public Health Association presents the following tables which are similar to those published in previous years covering data concerning students registered in schools of public health, and the public health degrees granted in the calendar year 1936.

College Enrollment in Public Health Courses

Number of students enrolled, and Public Health Degrees and Certificates conferred in the year 1936 in courses requiring at least 1 year of residence, by United States and Canadian Universities.

Table I

	No. of Students Registered 1935–1936				*No. of Degrees Granted 1936*		
Name of University	*Men*	*Women*	*Total*	*Degrees Offered*	*Men*	*Women*	*Total*
University of California	3	5	8	A.B.	0	0	0
				M.A.	0	0	0
				Ph.D. in Hyg.	0	0	0
				Dr.P.H.	0	0	0
DeLamar Institute of Public Health, Columbia University	10	3	13	M.S.P.H.	9	2	11
Harvard School of Public Health	32	2	34	C.P.H.[1]	4	0	4
				M.P.H.	18	2	20
				Dr.P.H.	2	0	2
Johns Hopkins School of Hygiene and Public Health	105	29	134	C.P.H.	40	1	41
				Dr.P.H.	7	0	7
				Sc.D.	3	2	5
				Sc.M.	0	4	4
Massachusetts Institute of Technology	52	5	57	C.P.H.	0	0	0
				Dr.P.H.	0	0	0
				S.B. in P.H.	8	1	9
				Ph.D.	0	0	0
McGill University	2	0	2	D.P.H.[2]	2	0	2
University of Michigan	46	23	69	M.S.P.H.	9	2	11
				Dr.P.H.	5	0	5
University of Toronto	12	0	12	D.P.H.[2]	10	0	10
				Ph.D.	0	0	0
Wayne University College of Medicine	2	1	3	Dr.P.H.	0	0	0
Yale School of Medicine	10	4	14	M.P.H.	1	0	1
				Dr.P.H.	1	0	1
				Ph.D.	0	1	1
Total	274	72	346		119	15	134

1. Harvard does not give the C.P.H. as a degree.
2. Diploma of Public Health.

CLASSIFICATION OF PUBLIC HEALTH DEGREES AND CERTIFICATES GRANTED

Number of persons receiving degrees and certificates by reason of public health courses completed:

TABLE II

Degree	*No. of Degrees Granted*	*No. of Schools Offering Degrees*
Certificate in Public Health	45	3
Master of Public Health	26	2
Doctor of Public Health	10	7
Master of Science in Public Health	22	2
Doctor of Science	5	1
Bachelor of Arts in Public Health	0	1
Master of Arts in Public Health	0	1
Master of Science	4	1
Doctor of Philosophy	1	4
Diploma in Public Health	12	2
Bachelor of Science in Public Health	9	1
Total	134	

Number of Degrees and Certificates conferred by United States and Canadian Universities for 1934, 1935, and 1936:

TABLE III

School	*Degree*	*1934*	*1935*	*1936*
University of California	A.B.	7	2	0
	M.A.	0	0	0
	Ph.D. in Hyg.	0	0	0
	Dr.P.H.	0	0	0
DeLamar Institute of Public Health, Columbia University	M.S.P.H.	7	9	11
Harvard School of Public Health	C.P.H.[1]	6	6	4
	M.P.H.	7	13	20
	Dr.P.H.	1	0	2
Johns Hopkins School of Hygiene and Public Health	C.P.H.	37	28	41
	Dr.P.H.	6	6	7
	Sc.D.	16	6	5
	Sc.M.	6	3	4
Massachusetts Institute of Technology	C.P.H.	4	3	0
	Dr.P.H.	0	0	0
	M.S.	3	1	0
	S.B. in P.H.	9	13	9
	Ph.D.	0	0	0
McGill University	D.P.H.[2]	0	0	2
University of Michigan	M.S.P.H.	12	22	11
	Dr.P.H.	3	3	5
University of Toronto	D.P.H.[2]	13	11	10
	Ph.D.	3	0	0

TABLE III (Cont.)

School	*Degree*	*1934*	*1935*	*1936*
Wayne University College of Medicine	Dr.P.H.	2	0	0
Yale School of Medicine	C.P.H.	5	2	0
	M.P.H.	0	0	1
	M.S.	0	1	0
	Dr.P.H.	4	1	1
	Ph.D.	0	1	1
Total		151	131	134

1. Harvard does not give the C.P.H. as a degree.
2. Diploma of Public Health

Number of Degrees and Certificates in Public Health granted in United States and Canada, 1934, 1935, and 1936:

TABLE IV

Degrees and Certificates	*1934*	*1935*	*1936*
C.P.H.	52	39	45
M.P.H.	7	13	21
Dr.P.H.	16	10	15
M.S.P.H.	19	31	22
Sc.D.	16	6	5
B.A.	7	2	0
Sc.M.	9	5	4
Ph.D.	3	1	1
D.P.H.	13	11	12
B.S.	9	13	9
Total	151	131	134

(Report continued on next page)

COLLEGE ENROLLMENT AND DEGREES GRANTED IN COURSES FUNDAMENTALLY ENGINEERING IN CHARACTER BUT PROVIDING TRAINING IN PUBLIC HEALTH WORK

In reply to numerous requests, the Committee on Professional Education has this year for the first time collected data on college enrollment in courses fundamentally engineering in character but which provide training in public health work. The following table gives figures for enrollment during the period 1933–1936 as well as figures on the degrees granted during the same time.

TABLE V

	College Enrollments 1933–1936				*Number of Degrees Granted 1934–1936*				
Name of University	*1933–1934*	*1934–1935*	*1935–1936*	*Total*	*Degrees Offered*	*1934*	*1935*	*1936*	*Total*
Agricultural & Mechanical College of Texas	13	5	11	29	B.S. in C.E. (San. Eng. option)	8	4	6	18
					M.S. in Municipal & San. Eng.	1	1	0	2
Cornell University [1]	17	15	12	44	M.C.E. (San. Eng. option) M.S. in Eng. (San. Eng. option) Ph.D. in Eng. (San. Eng. option)	8	7	8	23
Harvard University (Graduate School of Engineering)	17	13	26	56	S.M. in Eng. (Sanitary)	10	9	7	26
					S.D.	0	0	1	1
Iowa State College	11 Undergrad.	8 Undergrad. 2 Grad. with M.S.	7 Undergrad. 1 Grad. with M.S.	26 Undergrad. 3 Graduates	B.S. in C.E. (San. Eng. option)	11	8	7	26
					M.S. in C.E. (San. Eng. option)	0	0	0	0
					Ph.D.	0	0	0	0
Johns Hopkins University	10	5	11	26	Bachelor of Engineering	10	5	11	26
					Master of Engineering	0	0	0	0
					Doctor of Engineering	0	0	0	0
Lehigh University [2]	..	2	1	3	B.S. in San. Eng.	..	0	1	1
Massachusetts Institute of Technology	17 Undergrad. 2 Graduates	15 Undergrad. 3 Graduates	16 Undergrad. 1 Graduate	48 Undergrad. 6 Graduates	S.B. in San. Eng.	5	1	2	8
					S.B. in P.H.Eng.	0	2	4	6
					S.M. in San. Eng.	1	2	0	3
					Sc.D. in San. Eng.	0	1	0	1
New York University	15 Undergrad. 6 Graduates	10 Undergrad. 8 Graduates	20 Undergrad. 18 Graduate	45 Undergrad. 32 Graduates	B. S. in C.E. (San. Eng. option)	15	9	20	44
					M.S. in C.E. (San. Eng. option)	1	1	4	6
Stanford University [3] (Graduate School)	5	3	2	10	*Engineer in C.E.: San. Eng.*	2	1	1	4
University of California (Junior and Senior Years)	20	30	30	80	B.S. in Eng. (San. Eng. option) [4]	10	20	9	39
					M.S. in Eng. (San. Eng. option)	0	0	0	0
University of Illinois	8	5	6	19	B.S. in C.E.	6	2	2	10
					M.S. in C.E.	2	1	3	6
					Ph.D.	0	1	0	1
University of Kansas	6	6	6	18	B.S. in C.E. (San. Eng. option)	2	3	3	8
West Virginia University	4	6	6	16	B.S. in C.E. (San. Eng. option)	4	6	6	16
Total	151	136	174	461	Total	96	84	95	275

1. Number of students and graduating degrees relate to those especially interested in Sanitary Engineering options including both undergraduates and graduates.
2. Curriculum in San. Eng. organized in 1933–1934.
3. 2 Years after A.B.
4. Only graduates from formal course in San. Eng. included.

Summary

No. of Students Registered	1933–1934	151
" " " "	1934–1935	136
" " " "	1935–1936	174
Total		461

No. of Degrees Granted	1933–1934	96
" " " "	1934–1935	84
" " " "	1935–1936	95
Total		275

PUBLIC HEALTH NURSING DEGREES AND CERTIFICATES GRANTED 1935–1936

The following table, reprinted with permission from *Public Health Nursing*, presents data on students registered during the school year 1935–1936 in public health nursing courses approved by the National Organization for Public Health Nursing. For this year there were 18 courses which met the requirements established by the N.O.P.H.N., but figures were available for only 16 of the courses. (No information was received from Fordham University, New York, N. Y., and the University of Hawaii, Honolulu, T.H.)

TABLE VI

Number of Students Registered in Approved Courses in Public Health Nursing and Number of Certificates and Degrees Given in Academic Year 1935–1936 and Summer Session 1936

State	Institution	Year	Total Registration	Graduate Students Registered	Undergraduate Students Registered	On Full-time Schedule	On Part-time Schedule	Certificates Given or Full Public Health Nursing Program Completed	Degrees Granted: B.S. or B.A.	Degrees Granted: M.S. or M.A.
Calif.	Univ. of California Div. of Nursing Ed. Berkeley	Year 1935-1936 Summer Session	100 78	80 78	20 ..	100 78		31 ..	20 ..	
D. C.	Cath. Univ. of America [1] School of Nursing P.H.N. Division Washington	Year 1935-1936 Summer Session	27 20	27 20		5 20	22 ..	5 ..		
Mass.	Simmons College School of Nursing Boston	Year 1935-1936 Summer Session	87 42	57 42	30 ..	87 ..	.. 42	17 ..	10 ..	
Mich.	Univ. of Michigan Dept. of P.H.N. Ann Arbor	Year 1935-1936 Summer Session	91 133	91 133		63 133	28 ..	10 ..	10 ..	2 ..
	Wayne University College of Lib. Arts Dept. of Nursing Detroit	Year 1935-1936 Summer Session	588 28	578 28	10 ..	29 4	559 24	60 ..	4 ..	
Minn.	Univ. of Minnesota Dept. of Preventive Medicine and P. H. Minneapolis	Year 1935-1936 Summer Session	448 154	427 154	21 ..	361 133	87 21	37 ..	17 ..	
Mo.	Washington Univ.[2] School of Nursing Dept. of P.H.N. St. Louis	Year 1935-1936 Summer Session [2]	57	50	7	17	40	9	4	..
N. Y.	Columbia University Teachers College Dept. of Nursing Ed. New York	Year 1935-1936 Summer Session	307 161	307 161		[3] No distinction	[3]	[4] ..	15[5] ..	95 ..
	Univ. of Syracuse College of Medicine Dept. of P.H.N. Syracuse	Year 1935-1936 Summer Session	64 172	64 172		22 143	42 29	10 ..		
Ohio	Western Reserve Univ. Sch. of App. Soc. Sc. Cleveland	Year 1935-1936 Summer Session	66 35	61 35	5 ..	55 33	11 2	36 ..		2 ..
Oreg.	Univ. of Ore. Med. Sch. Dept. of Nursing Ed. Portland	Year 1935-1936 Summer Session	25 26	25 26		20 26	5 ..	19 ..	8 ..	
Pa.	Univ. of Pennsylvania [1] School of Education Dept. of Nursing Ed. Philadelphia	Year 1935-1936	65	65	..	4	61	..	..	..

(Continued on next page)

TABLE VI (Cont.)

Number of Students Registered in Approved Courses in Public Health Nursing and Number of Certificates and Degrees Given in Academic Year 1935–1936 and Summer Session 1936

State	Institution	Year	Total Registration	Graduate Students Registered	Undergraduate Students Registered	On Full-time Schedule	On Part-time Schedule	Certificates Given or Full Public Health Nursing Program Completed	Degrees Granted: B.S. or B.A.	Degrees Granted: M.S. or M.A.
Tenn	George Peabody College for Teachers Dept. of Nursing Ed. Nashville	Year 1935-1936	204	204	..	196	8	25	6	3
		Summer Session	177	177	..	173	4	..	..	..
	Vanderbilt Univ. School of Nursing Nashville	Year 1935-1936	21	21	..	17	4	10	8	..
Va	College of Wm and Mary School of Social Work and Public Health Richmond	Year 1935-1936	20	16	4	20	..	15	4	..
Wash	Univ. of Washington School of Nursing Ed. Seattle	Year 1935-1936	82	65	17	81	1	24	14	1
		Summer Session	75	74	1	75	..	..	..	..
		Total 1935-1936	2,252	2,138	114					
		Summer Session	1,101	1 100	1					
		TOTAL	3,353	3,238	115			308	120	17

1 Course started in September, 1935.
2 Course discontinued in June, 1936.
3. Winter session: full-time 73, part-time 176. Spring session: full-time 85, part-time 194.
4. Information not available.
5. Approximate number.

For the school year 1935–1936 the total course registration was reported as 3,353 as compared with 2,524 in 1934–1935, an increase of 829 students. The number who received certificates or who completed the full public health nursing program in the school year 1935–1936 was 308 as compared with 244 in 1934–1935, an increase of 64.

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What the Medical Student Should Be Taught About Vital Statistics*

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IF we assume the existence and use of vital statistics to be justified by their ultimate application to the prevention of disease and the promotion of health, then we must have a clear conception of the place of the medical student in the scheme of health promotion, because the nature of this concept will in a great measure determine the pedagogical approach to teaching the subject.

It is my conviction that much of the future of preventive medicine, in its broadest sense, rests with the private practitioner of medicine as contrasted with those technically trained as professional workers in public health. The reason for this lies in the shift of emphasis that is taking place. Most of the generalized principles of sanitation which may be applied in the mass are already in effect—I mean such maneuvers as controlling water and milk wherein no coöperation is asked of the individual except that he pay the bill. The future would seem to be concerned with more individualistic aspects, such as campaigns for immunization as in diphtheria, or even treatment and cure as in syphilis, wherein the technic cannot be applied so clearly in the mass but is the result of an individual relationship between doctor and patient. It is this type of preventive work which is looming large on the horizon, bringing into prominence the general practitioner. Since most medical students are general practitioners in embryo, it is the teacher's responsibility to add to their background anything that will contribute to the effectiveness of the part they play in prevention in the future. This type of approach not only justifies but makes mandatory the inclusion of much material not essential to the training of a physician of the past.

In all probability, the future will see the medical man, by reason of his position in the pattern of community mores, having a close relationship to social evolution, in which case he will have to be able to follow intelligently, and to judge with discrimination, much work which will be expressed in the terminology of vital statistics. The foregoing are some of the points which might be advanced as reasons for saying that the time has passed when it was sufficient to offer the medical student a few scattered facts on crude death rates.

The student should know the prin-

* Read before the Vital Statistics Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

ciples of tabular and graphic presentation of data, not only because he may wish to present data, but also because he will inevitably encounter such data in his professional journals and should recognize the pitfalls of bad presentation and the possibilities inherent in optical illusions. A practical field which merits more attention than it is getting covers history forms, survey blanks and other record sheets, and the methods of manipulating such records including mechanical sorting and tabulating. Familiarity with this field is advisable not because the doctor will necessarily use such methods, but, what is more important, an understanding of the technic will make for coöperation on the part of medical men, whereas ignorance usually leads to lack of coöperation or even active opposition. This is the reason for giving the medical student an understanding of statistical technic which the general practitioner will never have to use.

It is not necessary or advisable that the medical student should be harassed with formulae or mathematical symbols. The average medical student is filled with fear at the sight of a mathematical formula. Apparently, to him, a Greek letter is at home only in connection with a fraternity and while he may understand that a prescription is merely a shorthand method of putting concisely an elaborate statement in pharmacology, it is expecting too much to ask him to think the same of the symbolical formulae in mathematics. To put it a little differently, he uses a microscope without being able to grind the lenses, or knowing anything about the formula of curvature of the lenses, and in the same way he should be able to use, as far as it is advantageous to him, the tool of statistical method without too much concern as to its internal construction.

With this type of approach it is possible to give the medical student a fair grasp of correlation and simple curve fitting. He will not be able to calculate a coefficient of correlation, or solve the normal equations for a curve fit, but will be able to translate the terminology of a correlation coefficient and state its implications, and will know the difference between a fitted curve and one that is not so treated.

A discussion of sampling can be offered leading up to the probable error concept, at the end of which the student knows what is a probable error and no longer confuses it with instrumental error or errors of observation. Under the heading of probable error comes the whole question of differences and their significance. A great deal of scientific work, especially in medicine, hinges on the delineation of differences; the difference between an experimental and control group or between a treated and untreated group; and it is not difficult to arrest the attention of even the most clinically minded medical student with discussions of this particular segment of the field of probability. The same applies to the attributes of a "control" and time is never wasted when it is devoted to the question of what constitutes an adequate control. In this way many students develop a caution and discrimination in scientific judgment which is one of the most important traits the student can acquire, and I know of no better way of getting it than by a proper contemplation of the theory of sampling and probability. The cultural and maturing effects of this subject are such that one need offer no apologies for time spent on it, and the gratitude of the better students for having been introduced to the field is testimony of its worth.

In connection with rates and ratios, the various forms of death rates, case fatality rates, and morbidity rates are discussed mainly with the idea of stressing in the student's mind how crude the crude death rate is and how

important it is to have a clear concept of those "exposed to risk." The age specific death rate leads smoothly into the life table, which is presented for just what it is, the most compact method of presenting the essential facts about age distribution of mortality. The student will not be able to construct a life table, but at least he will know the difference between the mean age at death and the so-called life span, a distinction that eludes most of our best physicians. Under this same treatment of death rates is presented the death certificate and with special reference to the *International List of Causes of Death*. Quizzing is designed to bring out the relative value of different rubrics from a scientific standpoint, and when correlated with necropsy work by the department of pathology it may be shown how difficult it may be to assign a principal cause of death in many cases. Such an approach gives the student a real interest in the death certificate. In our classes each student is presented with a copy of *The Physician's Pocket Reference* as published by the Bureau of the Census, but, what is most important, every final examination includes at least one question on the certification of death and these questions are such as to challenge the mettle of even the best students. This engenders a respect for certification and also results in a great deal of discussion among the students outside of class hours.

Sometimes a broad type of thinking can be encouraged under the guise of something else, for example, the frequency distribution is presented and its constants are developed. This leads naturally to a consideration of variability and this in turn can be regarded as one of the chief attributes of living matter. It does not take a particularly gifted teacher to cause the medical student to regard with suspicion much of his former thinking on the so-called "norms." If variability has been approached from enough different angles the student will suddenly be shocked at the realization that he would not expect all patients to have the same length of nose, but he does expect them to have very much the same pulse rate or white blood count. Meditation along these lines will do no harm to the student even if he is to devote his future exclusively to clinical medicine.

The time necessary to achieve the approach I have outlined is not excessive. Ten to twelve 1 hour lectures with an equivalent amount of time for quizzing is enough though this will mean hard work for both teacher and student. The teacher must have his material well organized so that there is no waste motion and the student must have enough intellectual stamina to follow a difficult lecture up to the last minute. Any additional time available can be used advantageously in developing such broad aspects of human biology as fertility, population problems, and the more refined technics of investigation, such as the Chi-square test and its application to the fourfold table. I do not consider these last essential to the rank and file of medical students but it is surprising how, especially in late years, a demand is growing among the students to have such topics included in the regular work. This seems to me to be a result of the improvement in interne services, many of which lead to a fair amount of independent investigation on the part of the interne. Indeed it would not seem excessive to predict that the teaching of vital statistics in the manner outlined will be a required part of the curriculum in the better medical schools in the near future, and this might well be hastened by the growth of biophysics, although the whole will probably be delayed by the lack of properly qualified teachers. Laboratory work would be highly desirable, but in view

of the already overcrowded medical curriculum it is very unlikely that such exercise can find a place in undergraduate work. As a postgraduate subject it may well come. I have made no mention of visits to offices of registrars or divisions of vital statistics. In our work we do not include such visits. We attempt to time the course and arrange the content so that it extends to capacity even the best students, and it has been my experience that there is little intellectual adventure available in the office of the average division of vital statistics of the present day.

For the text to be used in connection with lectures and quiz sections, there is none that equals Pearl's *Medical Biometry and Statistics*. The treatment used by Pearl is so obviously medical in tone that the medical student finds himself at home among familiar terms and problems, with examples from medical literature.

Many questions about the teaching of the subject are still unanswered and remain matters of opinion, among them the already mentioned point of laboratory work. There is the question as to what year in the medical course is best. The answer to this may vary from any one of the 4 to all of them, that is, spreading the work through all 4 years. We chose the last half of the sophomore year. The student has had most of the basic sciences by this time but has not yet been completely seduced by the bedside aspects of disease. We feel that this is the most opportune time to expose his mind to the influences briefly outlined.

There are many other questions still unanswered but time does not permit of their discussion. Lack of agreement among teachers of vital statistics as to time, course content, etc., is not a peculiar attribute of the field but is held in common with teachers of other branches of the medical curriculum. As far as I know there is little or no complete agreement on approach, course content, and teaching technic for any one medical subject.

In conclusion may I not emphasize that we must never lose sight of the fact that by long odds the greatest proportion of data in the field of public health originates in the hands of the physician. Any training he gets as a student, during his formative years, which leads to a better understanding and appreciation of such data will probably emerge some time on the credit side of the public health ledger.

An Organism Resembling Hemophilus Pertussis

With Special Reference to Color Changes Produced by Its Growth Upon Certain Media

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IT is now generally believed that recently isolated strains of *Hemophilus pertussis* belong to a single serological type.[1] It is well known, however, that under certain cultural conditions typical strains of the organism undergo definite morphological and immunological changes.[2, 3, 4, 5] Failure to consider these changes, no doubt, has led workers in certain instances to conclude that more than one type of *Hemophilus pertussis* may be recovered from the upper respiratory tract of persons suffering from the disease.

The fact that *H. pertussis* is related in certain immunological respects to *Brucella bronchisepticus* as demonstrated by Ferry and Noble[6] may have some clinical and epidemiological significance. The latter organism has been isolated from the respiratory tract of human beings[7, 8] and apparently has caused clinical symptoms in a child resembling those of whooping cough.[7] Moreover, a group of cultures resembling both *H. pertussis and Br. bronchisepticus* but not identical with either was recently described by Eldering and Kendrick.[9]

This report deals with certain observations made upon a group of 10 atypical strains isolated by the cough-plate method from cases of suspected pertussis.

SOURCE OF CULTURES

Eight of our strains upon isolation were regarded as *H. pertussis* until further studies indicated that they constituted an atypical group. One strain (We) was received from Dr. L. W. Sauer as a culture of *H. pertussis* and one (309) was furnished by Dr. Pearl Kendrick as typical of the group reported by Eldering and Kendrick. This strain seemed to be very similar, if not identical, with ours, particularly in regard to its effect upon peptone-iron-agar and upon egg-glycerin-agar media.

Two of our strains (Ru) and (Fe) were isolated from infants aged 8 and 15 months respectively who were closely observed in the hospital for several weeks during which each presented all the clinical features of moderately severe pertussis. The white blood cell counts were 17,500 and 36,000 respectively. The remaining 6 strains were isolated from typical, though in several instances mild, cases of pertussis treated in their homes. During this time there was a decided increase in the incidence of pertussis in Rochester.

Since the 8 strains were observed in a series of approximately 160 consecutive positive plates, it would seem that in this community this organism constituted about 5 per cent of the strains isolated.

MORPHOLOGY AND GROWTH

Upon the original cough-plate medium consisting of the usual potato-glycerin-sheep's blood agar preparation, the colony was identical with that of typical *H. pertussis* except that growth appeared with a definite zone of hemolysis after 24 hours' incubation at 35° C. The majority of typical strains of *H. pertussis* required 72 hours under these conditions to produce the zone of hemolysis.

In the second and subsequent generations growth was faster and more abundant and the atypical strains were adapted to plain agar more readily than were the typical strains. The atypical strains remained hemolytic longer when sub-cultured upon either Bordet-Gengou or chocolate-agar medium. One strain, isolated in October, 1935, has remained strongly hemolytic to the present.

When freshly isolated, the characteristic coccoid-bacillary form was noted with very little, if any, tendency to pleomorphism. When sub-cultured upon chocolate-agar medium, the organism rapidly became longer and pleomorphic.

One strain (Ru) when sub-cultured upon chocolate-agar medium at 4 day intervals for 8 weeks lost its hemolytic power and became weakly antigenic in rabbits resembling closely the behavior of avirulent *H. pertussis*.

Growth of the organism upon slants of Bordet medium produced a definitely darker discoloration of the medium in 48 hours than did typical strains of *H. pertussis*. By noting this difference we could usually arrive at a presumptive identification of the culture. Upon plain agar, Bradford's gonococcus medium,[10] and other types of medium, growth more closely resembled that of *Br. bronchisepticus* than that of *H. pertussis*.

Growth in Douglas broth was abundant, and after 5 to 7 days produced the characteristic ropy-mucoid type with a brownish-red discoloration of the broth. *H. pertussis* did not produce this color change in the broth but did often produce a similar type of sediment.

The organism was Gram-negative and non-motile. It stained well with toluidin blue and resembled *H. pertussis* in this respect. Capsules were not demonstrated.

BIOCHEMICAL ACTIVITIES

Indol was not produced by growth in peptone water nor in tryptophane broth. Nitrates were not reduced to nitrites. Milk was made alkaline more rapidly than by *H. pertussis*. There was no production of H_2S when grown upon lead acetate medium or when grown upon Bradford's medium in slants above which were suspended strips of filter paper impregnated with lead acetate. Upon potato, the organism grew well and produced a brownish-black color in 48 hours. A similar color resulted from the growth of 2 strains of *Br. bronchisepticus*.

Upon Levinthal's medium growth was much more rapid than *H. pertussis* and a light brown discoloration of the me-

dium occurred. This observation lead to the recognition of one of the chief characteristics of this organism. This discoloration suggested that it might be due to some change in the x-factor (or iron-containing factor) of the medium. All of the atypical strains were then cultured upon peptone-iron-agar slants and in each a definite brownish-red change occurred along the slant but very little along a stab into the butt. Typical strains grew slowly upon this medium and even when fully adapted to it, did not produce this discoloration. A typical strain of *Br. bronchisepticus* obtained from Dr. Ferry likewise failed to produce the color. We believe, therefore, that the use of peptone-iron-agar medium is a rapid method of obtaining a presumptive diagnosis of this organism.

Effort has been made to determine the nature of this change in color. When 48 hour slant growths were extracted with water, alcohol, or acetone for 24 hours, the solutions became light brown and resembled in color known solutions of iron compounds. It was not soluble in ether or chloroform. Aqueous extracts of the agar mixture upon which typical strains had grown and of uninoculated agar mixture remained colorless. The pH of the aqueous extracts determined with the LaMotte Comparator were: atypical strains, 7.4; typical strains, 7.0; agar control, 6.8.

Absorption curves were made with a Bausch and Lomb Quartz Spectroscope* on the aqueous extracts of the agar growth of 3 atypical strains, of 1 typical strain, of uninoculated agar medium, and of solutions of ferric ammonium citrate, of ferric chloride and of ferric alum. The solutions of the known iron compounds were made approximately to match in color those of the atypical strain extracts.

In each instance curves were obtained in the ultra-violet with peaks at 2,670 Ångström units. Since these curves were very similar, the discoloration of the medium by the atypical strain is due probably to some change in the iron brought about by the growth of the organism; perhaps a conversion of the metal from the organic to an inorganic form such as ferric oxide or ferric hydroxide. Such a change might be facilitated by the more alkaline reaction resulting from the growth of the atypical strain.

On slants of egg-glycerin-agar growth occurred rapidly, and after 48 hours gave a grayish-brown color resembling anchovy paste. Two strains of *Br. bronchisepticus* produced similar discoloration on this medium while 30 typical strains of *H. pertussis* produced no change.

When 48 hour growths upon chocolate-agar plates were flooded with a 1 per cent solution of hydrogen peroxide, there was an immediate vigorous "bubbling" indicating that there had been considerable production of catalase. Growth of typical *H. pertussis* strains produced very little, if any, catalase when tested in this manner, while *Br. bronchisepticus* gave a marked reaction.

ANIMAL INOCULATIONS

A standard suspension containing approximately 10 billion organisms per c.c. was employed for all animal inoculations. This was prepared by scraping a 48 hour growth from Bradford's medium into physiological salt solution, and adjusting to match a standard suspension.

Mice: Intratracheal injection of 0.05 c.c. of this standard suspension into white mice produced typical interstitial pneumonia, about 75 per cent dying in 2 to 10 days. Almost pure cultures of the organism could be cultured

* We are indebted to Dr. L. T. Steadman of the Division of Radiology for this information.

TABLE I

Agglutination Tests Comparing 9 Typical with 7 Atypical Strains of H. Pertussis

	Sera			
	Typical		*Atypical*	
Strains				
Typical	*O'C #301*	*Ba #338*	*Ru #884*	*Wa #336*
Sp	1,280	1,280	320	320
Ho	160	160	00	00
We	1,280	2,560	320	160
Mo	2,560	1,280	80	160
Ot	1,280	160	160	10
Ba	2,560	5,120	160	40
La	2,560	2,560	320	320
We	2,560	160	160	10
O'C	5,120	5,120	20	80
Atypical				
We	160	20	2,560	2,560
La	40	40	2,560	2,560
Fe	20	160	2,560	2,560
Mi	160	80	2,560	2,560
Wa	80	40	5,120	5,120
Ru	80	40	5,120	5,120
Ke	40	160	10,240	2,560

from the lungs of animals sacrificed 14 to 22 days after inoculation. In some instances a marked leucocytosis resulted as demonstrated by blood counts during life. A similar lung lesion produced by intranasal inoculation of mice with *H. pertussis* has been described by Burnet.[11] Intraperitoneal inoculation of mice with dosages ranging from 0.2 c.c. to 0.5 c.c. of the standard suspension resulted in invasion of the blood stream and death within 48 hours. Hemorrhagic lesions of the peritoneum, kidneys, liver, and lungs were found similar to those observed after inoculation with strains of typical *H. pertussis.*

Rabbits and guinea pigs: Intradermal inoculations of 0.1 c.c. of a 1 to 10 dilution of the standard suspension produced hemorrhagic necrotic lesions within 72 hours identical with those produced by the injection of typical *H. pertussis.*

IMMUNOLOGICAL STUDIES

Each of the strains has proved strongly antigenic for rabbits. Animals averaging 2 to 2.5 kg. were immunized by intravenous injections. Suspensions of the organism were made in physiological salt solution from 48 hour growths of Bradford's medium, standardized to contain approximately 10 billion organisms per c.c. and killed by the addition of merthiolate in a 1 to 10,000 concentration. The rabbits were immunized according to the method of Kendrick,[12] receiving intravenously 0.2 c.c., 0.4 c.c., and 0.8 c.c. of the suspension per kg. of body weight at 4 day intervals. Trial bleedings were done 10 days after the last injection, and when the agglutination titer was sufficiently high, the serum was collected and stored at 4° C. Agglutination tests were done by the rapid method of Kendrick[13]; absorption tests by inoculating 1 to 10 dilutions of the serum with heavy suspensions of the absorbing strain. After thorough mixing, the serum-antigen mixture was stored at 4° C. for 24 hours, after which the serum was cleared by centrifugalization.

TABLE II

Agglutinin Absorption Reactions Comparing 2 Typical with 2 Atypical Strains of H. Pertussis

Serum	Absorbing Strain	Before or After Absorption	Typical Strains		Atypical Strains	
			O'C	Ba	Ru	Wa
O'C #301		Before	5,120	5,120	80	80
(Typical)	O'C	After	40	00	00	00
	Ru	After	1,280	2,560	00	00
Ba #338		Before	5,120	5,120	40	40
(Typical)	Ba	After	160	80	20	40
	Wa	After	160	80	00	00
Ru #888		Before	20	20	2,560	2,560
(Atypical)	Ru	After	00	00	00	00
	O'C	After	00	00	2,560	2,560
Wa #336		Before	10	00	2,560	2,560
(Atypical)	Wa	After	10	00	00	00
	Ba	After	10	10	1,280	320

DISCUSSION

The agglutinin titers recorded in Table I clearly show that there was a distinct difference between the typical and atypical strains, although sufficient cross-reactions existed to indicate some immunological relationship between the two. This is further indicated in Table II where it is noted that the agglutinins of a typical antiserum, Ba, for typical strains were significantly removed by absorption with the atypical strain, Wa, and also that the agglutinins of an atypical antiserum, Wa, were definitely reduced by absorption with the typical strain, Ba.

No agglutination resulted when 2 typical antisera (O'C and Ba) and 2 atypical antisera (Ru and Wa) were set up with a stock strain of *Br. bronchisepticus* obtained from Dr. Ferry.

It is evident from a study of the cultural, biochemical, and immunological reactions of this group of strains that they constitute a very definite group of pertussis-like organisms, probably more closely related to *H. pertussis* than to *Br. bronchisepticus*. The most conspicuous characteristic of the group was the definite discoloration produced by growth on either peptone-iron-agar or egg-glycerin medium, which affords a method for rapid identification. There seems to be sufficient immunological difference between them and typical strains of *H. pertussis* to suggest that they should be recognized in the preparation of pertussis vaccine.

SUMMARY

During the routine examination of cough-plate cultures for the diagnosis of pertussis, a group of atypical strains of organisms resembling *H. pertussis* has been observed. Eight (5 per cent) closely related strains have been collected in 160 consecutive positive cultures.

Although these atypical strains are morphologically, biochemically, and immunologically related to typical strains of *H. pertussis*, there are the following important differences: (a) The atypical strains grow more readily and remain hemolytic for a longer time. (b) They produce a very characteristic brownish-red discoloration when grown upon peptone-iron-agar and a brownish-gray color upon egg-glycerin agar. (c) They are strong catalase producers.

Each of the 8 strains was strongly antigenic when injected into rabbits. It

is suggested that a representative strain of this group be included in pertussis vaccine for immunization purposes.

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ANNOUNCEMENT

THE SIXTY-SEVENTH ANNUAL MEETING

of the

AMERICAN PUBLIC HEALTH ASSOCIATION

will be held

Tuesday, October 25, to Friday, October 28, 1938

Kansas City, Missouri

A Rapid Method for Demonstrating Negri Bodies in Tissue Sections

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SINCE Negri [1,2] first described the bodies which bear his name and which are pathognomonic of rabies, workers have sought to develop improved methods for demonstrating Negri bodies in tissue sections. Rapid methods [3–6] are available for films of fresh brain tissue. Occasionally, Negri bodies can be demonstrated, especially in human material, only after a careful study of paraffin sections. Moreover, the cellular relationships are well preserved so that the search for Negri bodies, which are invariably intracellular inclusions, is greatly facilitated and the smaller bodies can be more readily detected. Since paraffin sections are more permanent than films, material is available for histological studies.

The methods most commonly employed in this country for staining Negri bodies in sections [7–10] have the disadvantage of requiring in most instances 48 hours or more. An attempt was therefore made to devise an efficient procedure which would be less time consuming. The Wilhite stain,[11] modified for use with paraffin sections by increasing the rosanilin from 1.5 to 1.8 gm. and the methylene blue from 0.9 to 1.0 gm. and decreasing the glycerol and methyl alcohol from 125 to 100 c.c., was found to be the most satisfactory. By shortening fixation in Zenker's fluid to 6 hours and using the modified Wilhite stain, less than 30 hours is required.[12]

A greater saving of time has resulted from the use of dioxan as a dehydrating and clearing agent.[13–15] Comparative studies were made of these newer technics and a method has been developed by which paraffin sections are prepared within 3 hours after fixation, and excellent sections of tissue from rabid animals are available within approximately 8 hours of the receipt of the specimens. Nelson [16] has recently published a rapid method for preparing paraffin sections by the use of dioxan which is similar to this except for the use of acetone, which has not been found necessary in the procedure here described.

Dioxan (diethylene oxide) is a clear, colorless fluid readily miscible with water, alcohol, and molten paraffin. It permits rapid dehydration and clearing of tissue with very little distortion. Less shrinkage occurs than with the usual paraffin technic. Since it is volatile and acts as a cumulative poison, caution must be exercised and the container must be carefully stoppered. Prolonged exposure to its vapor even in a 1:1,000 concentration produces severe toxic effects.[17] Dioxan can be purchased through most commercial houses and is relatively inexpensive as it can be used several times.

TECHNIC

Fix blocks not more than 3 mm. in thickness of fresh tissue from the hippocampus major and the cerebellum in Zenker's solution for 4 hours at 37° C. Wash 30 minutes in running tap water. The tissue may be left in running water over night. For dehydration, use preferably a bottle with a tightly fitting ground glass stopper to prevent vapor from escaping, on the bottom of which anhydrous calcium chloride is put to a depth of about 1 cm. Add about 80 c.c. of dioxan containing a few flakes of iodine to assist in removing the mercury precipitate from the tissues. Place the blocks in the dioxan, supported well above the layer of calcium chloride. (A non-corrosive wire tripod with a fine mesh screen has been used.) Stopper the bottle tightly and keep the material at 37° C. for 1 hour.

Transfer the blocks to a mixture of equal parts of dioxan and paraffin and hold for 1 hour at 56° C. Care should be taken to have the blocks rest a few centimeters above the bottom of the bottle, since dioxan tends to settle.

Place the blocks in a paraffin bath at 56° C. for 1 hour; then embed in paraffin. Cut sections 4 μ in thickness and attach to slides with Mayer's albumin fixative. Heat slides carefully, section up, over a low Bunsen flame until the paraffin begins to melt. By that time, the water will have evaporated and the slides can be put in xylol. Remove paraffin in the usual manner and place slides in distilled water before staining sections.

STAINING METHOD

I. Stock solution.

Rosanilin (Gruebler)	1.80 gm.
Methylene blue (Nat. col.)	1.00 gm.
Glycerol (T. P.)	100.00 c.c.
Methyl alcohol (T. P.)	100.00 c.c.

Shake for several minutes. The mixture keeps indefinitely.

II. Solution.

1:40,000 aqueous solution of potassium hydroxide

For staining, add 1 drop of solution I to 2 c.c. of solution II. This mixture should be freshly prepared for each use.

Remove slides from the water; place on an electric plate; flood with freshly prepared stain and gently steam 5 minutes. Cool and wash quickly in tap water.

Decolorize and differentiate each section separately by gently swishing the slide in a jar of 90 per cent ethyl alcohol until the section assumes a faint violet color. This is a particularly important step.

Pass the sections rapidly through 95 per cent alcohol, absolute alcohol, and xylol. Mount in Canada balsam.

Negri bodies stain a deep magenta red and, under high magnification, the granular inclusions are dark blue. Nucleoli appear bluish black; cytoplasm, bluish violet; and red blood cells, a copper color.

DISCUSSION

Brains of dogs known to be or suspected of being rabid and those of normal animals were used in this study. Negri bodies were demonstrated in brain tissue fixed as late as 48 hours after death when the heads had been kept on ice. The Negri bodies, regardless of size, were readily differentiated by their deep magenta red color. Atypically staining inclusion bodies occasionally found in films of fresh tissue were not seen in specimens prepared by this method.

SUMMARY

A rapid and improved method for demonstrating Negri bodies in sections is described. The essential features are the short period of fixation in Zenker's fluid, the rapid preparation of paraffin sections by the use of dioxan, and the

employment of a modified Wilhite stain. The entire procedure, from the removal of the brain to completion of the sections, requires approximately 8 hours. The Negri bodies assume a deep magenta red color, which contrasts sharply with the staining of all other structures and permits easy identification.

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Nervous and Mental Diseases

IN the United States today, 450,000 people are social liabilities because of mental disease; 500,000 more are in prisons and reformatories; 1,000,000 more fail of being social assets because of a low level of intelligence. . . .

There is no escape from the issue. Man can redeem his fellow. Human society is as ruthless as the law of the jungle, but it can be as relentless in sweeping away obstructions to its own progress as in overcoming hindrances to its pleasures. Fear of ignorance is the only fear worthy of survival in our time. If we can abolish the other fears, which paralyze action, freedom, self-expression, and freeze out the happiness of childhood, we shall have done a service incomparably more memorable than the triumphs of bacteriology in the past half century.—*Haven Emerson, M.D.*, address before the First International Conference on Mental Hygiene.

EDITORIAL SECTION

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WE NEED A NEW AND STRONG FOOD AND DRUGS ACT

THE tragic deaths of some 67 persons scattered through 11 states of the Union through the taking of the so-called Elixir of Sulfanilamide-Massengill has called attention in a dramatic way to the need of better protection of the public against dangerous and untested drugs and preparations put out by manufacturing concerns. From time to time as attempts have been made to improve our Food and Drugs Act, this *Journal* has discussed our needs. In an editorial in February, 1936, page 183, there were given what were considered the chief points which needed amendment and showed the weaknesses of the Copeland Bill, S-5, then under consideration.

We are still operating under the Food and Drugs Act of 1906, as amended. All through it has been a fight by importers, manufacturers, and venders of food and drugs against consumers, with the consumers largely on the losing end. The defects of the Food and Drugs Act under which we are operating are summarized as follows:

"It does not provide adequate obligatory standards of purity, potency, wholesomeness, and labeling of foods and drugs. It provides no standards whatever for the soundness, safety, accuracy, potency, and labeling of the many devices that are now used for the diagnosis, mitigation, and cure of defect, deformity, injury, and disease. It provides no standard for the purity, safety and labeling of cosmetics. . . . It provides no adequate means of arresting the distribution of food at its source when there is reason to believe that it was contaminated there by dangerous bacteria. Finally, the Food and Drugs Act of 1906, as amended, is impotent against false or fraudulent advertising of foods, cosmetics, through newspapers, billboards, the radio, and any of the other channels open to advertisers." The Act allows the use of trade names through which even the standards for foods can be evaded.

The Tugwell Bill introduced into the 73rd Congress provided for a practical dictatorship and apparently failed largely on account of this feature. In the 75th Congress, 9 bills relating to food, drugs, etc., were introduced. One bill,

S-5, was introduced into the Senate by Senator Copeland, and passed March 9, 1937, since which time it has been before the House of Representatives. There is an apparent conflict of authority for enforcement, but even if passed, it is the opinion of those qualified to judge that it falls very short of giving the protection which the medical profession and the public has a right to demand.

A masterly summary of Federal Legislation on Food and Drugs has been prepared by the Bureau of Legal Medicine and Legislation of the American Medical Association.[1] It is difficult to summarize it, but it discusses fully the points brought out in the editorial in this *Journal* and mentioned in the present article. We commend it to the careful reading of all physicians and health workers, but wish also that the general public could be induced to study such questions.

The same issue of the *J.A.M.A.* contains accounts of experimental work showing that the lethal agent is not sulfanilamide, but diethylene glycol. We believe the collection of material concerning this wholesale poisoning, including its distribution, postmortem appearances, and experimental work showing the lethal effects of diethylene glycol, and of Elixir of Sulfanilamide-Massengill on animals, constitutes an outstanding service on the part of this *Journal* to the medical profession.

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JOSEPHINE ROCHE

PUBLIC health workers the country over are acutely aware of the great loss to the public service and especially public health service resulting from the resignation of Miss Josephine Roche as Assistant Secretary of the Treasury. Her broad knowledge of social problems; her knowledge of the interdependence of vital and natural resources; her appreciation of the opportunities for public health work to serve the cause of public welfare; all combined to give her the vision to see and the courage to bring about a recognition of the Federal Government's responsibility in the conservation of health that is now written into national policy by certain provisions of the Social Security Act. Policy is not action, however, and Miss Roche's service in administration and coördination of the expansion of service has been even more important than establishment of the policy for thus has thought been translated into action. Of her third progress report as Chairman of the Interdepartmental Committee for the Coördination of Health and Welfare Activities, the President said: " It marks extraordinary progress in bettering our health and welfare activities through a unified program which is causing the work of each department and agency to supplement that of others instead of conflicting with them. I know that the fine work this committee has done is largely due to the enthusiasm and hard work you have put into it as Chairman."

Truth is that the sense of values, experience, and practical idealism which made up Miss Roche's almost unique qualifications for the tasks she so well accomplished are all too rare, for she had successfully applied in private life the principles which she so ably advocated as a public servant. Those of us who had the rare privilege of close association with her in everyday work found her uncompromising devotion to the public interest a constant inspiration and an unfailing support. Perhaps this feeling was best expressed in the statement of Surgeon General Parran that " With the retirement of Assistant Secretary Roche,

the government loses its ablest and most sincere advocate of public health. As the first woman Assistant Secretary of the Treasury, and as the first person occupying that position primarily because of her knowledge of public health and social problems, Miss Roche has rendered a splendid and unique service. It has been a pleasure to work under her direction. I am delighted to know that she will continue to give some of her time to further coördination of the health and welfare activities of the government. I hope the loss of her services as Assistant Secretary will be only temporary."

It is encouraging that Miss Roche is to continue her connection with the Interdepartmental Committee. It is to be hoped that she can soon return to public service for the country can ill afford the loss of a public servant of such distinguished ability.

THE NATIONAL CANCER INSTITUTE

ON August 5, 1937, the National Cancer Institute Act was signed. This Institute will be a part of the U. S. Public Health Service, and the Act authorizing its creation calls for $750,000 for the erection and equipment of suitable facilities and a yearly appropriation of $700,000 to maintain the Institute. Its primary object will be research in all phases of cancer diagnosis, prevention and study of treatment, which will include radiology, specific cancer surgery, X-ray, pathology, biochemistry, bio-physics, and their relation to the disease. Any knowledge gained will be made available to doctors, societies, and health agencies all over the world who are engaged in cancer work. The appropriation also makes it possible for funds to be allocated as grants-in-aid for research projects, whether conducted by an individual or cancer research society, which show promise of making valuable contributions to human knowledge of aspects of the disease. The Council will decide which applications for such grants-in-aid have merit and should be so furthered, and which are useless and should not receive assistance.

Under the terms of the Act, radium may be purchased by the Institute, for use either in research or the treatment of cancer, and this radium may be lent to institutions in the United States established for the study of the cause, prevention, or diagnosis of treatment of cancer, or for its actual treatment. But that is not all. The Institute will coöperate in any manner necessary or feasible and permitted by law with already established organizations or individuals engaged in the fight on cancer. This can include public or welfare organizations, state, county, or municipal health departments, etc.

The plans for this Institute are practically ideal. They also include the power to establish and maintain research fellowships with such allowances as the Surgeon General may deem necessary to procure the most promising and brilliant research fellows from here or abroad. The Institute will also specifically provide the necessary facilities for the training and instruction in all technical matters pertaining to cancer diagnosis and treatment for people who, in the opinion of the Surgeon General, already have proper training and background to make them eligible.

The Institute is to be erected at Bethesda, Md., a mile beyond the northwest boundary of the District of Columbia, on land donated to the Public Health Service by Mrs. Luke Wilson and her son. The building in all probability will be begun in the spring of 1938.

The most recent step forward in this great undertaking is the appointment of a National Advisory Cancer Council, which was announced on September 29, 1937, by Surgeon General Thomas Parran. It contains an imposing list of names, with himself serving ex officio as Chairman: Dr. James Ewing, Dr. Francis Carter Wood, C. C. Little, Sc.D., Arthur H. Compton, Ph.D., James B. Conant, LL.D., and Dr. Ludwig Hektoen, men to whom the medical profession needs no introduction, and no recital of their achievements in their specialized fields of cancer and scientific research. An outstanding cancer clinician, the Editor of the *American Journal of Cancer,* the Managing Director of the American Society for the Control of Cancer, a Nobel Prize winner, the President of Harvard University, well known as an organic chemist, and an eminent professor of pathology—these qualifications only touch on the long list which these men bring to the Council table.

With 140,000 deaths a year in the United States from cancer, if this Institute can serve as the instrument eventually to lower this figure 20 per cent, it would be a very great thing. In the meanwhile, the careful planning, liberal consideration of the various phases of cancer research, and splendid nucleus of personnel, certainly stamp this new armory for cancer warfare as being a wise investment of the United States Government.

THE HEALTH OFFICER AND THE ACCIDENT PROBLEM

PUBLIC health is becoming increasingly interested and active in the accident problem. In an article which appeared in this publication last February, Dr. Edward S. Godfrey [1] urged that all health departments take an active part in preventing death from accidents. The Conference of State and Provincial Health Authorities has recently appointed a Committee on Uniform Traffic Accident Statistics. At the New York meeting of the American Public Health Association, a resolution was adopted at the instance of the Vital Statistics Section, urging that the President of the United States ". . . bring to the attention of the Congress the necessity for more intensive study of the accident problem and ask the Congress to make an adequate appropriation of federal funds, for a minimum period of two years, to be expended under the direction of the appropriate federal agencies, for a comprehensive nation-wide statistical survey of this problem."

Some persons might question why health officers and health organizations should interest themselves in the accident problem. A prime reason for participation is that some phases of the accident prevention campaign, notably the home accident problem, can best be carried out through the agency of the health department. A second reason, as Godfrey points out, is that there is no great social satisfaction or profit in saving lives from the hazards of childbirth, diphtheria, or typhoid fever, only to have those same lives snuffed out through preventable accidents. It is the privilege—nay the duty—of the health officer to encourage and promote any movement looking toward extension of life.

The number of fatal accidents in the United States has, during the last few years, approximated 100,000 per year.[2] These are divided about as follows: 12 per cent in industry, 25 per cent in the home, and 63 per cent in public places, principally through the agency of moving vehicles. Progress in the reduction of these mortalities has varied greatly. The campaign against industrial accidents has been highly efficacious; mortality from this cause has declined about 44 per cent in the last 23 years. The death rate for fatal accidents in the home has shown practically no decline during this time. The death rate for motor

vehicle accidents has increased enormously. The mortality per 100,000 population from this cause has increased 568 per cent during 23 years: from 4.4 in 1913, to 29.4 in 1936, when approximately 37,800 persons were killed in the United States.[5] The indications that the number of deaths per unit of auto traffic may have declined in the last 15 years,[4,5] are interesting, but they do not erase the fact that there is a frightful and unnecessary wastage of life from motor vehicle accidents, that this wastage is still on the increase, and that something beyond present efforts must be done to reduce this carnage.

What can the health officer do about the accident problem?

One of the needs in the situation is a detailed and well balanced program for health department participation. A number of opportunities are, however, obvious. The first of these concerns the field of home accidents. Here, physicians, public health nurses, and other health visitors can serve in an educational way. Other approaches can be made through schools, newspapers, and the radio. Although data about accidents are still incomplete, valuable information can be obtained from such sources as the National Safety Council in Chicago, the American Red Cross, insurance companies such as the Metropolitan and the Travelers, the Division of Vital Statistics of the Bureau of the Census, and the recent publication by Dublin and Lotka.[6] Among health department publications, those of Dr. Earle G. Brown for Kansas are especially to be consulted.

In the prevention of motor vehicle accidents, the primary responsibility probably must fall upon the police, motor vehicle, and highway authorities. The health officer, however, can still serve by coöperating or, if necessary, irritating. In particular, if there is no joint council of agencies for prevention of accidents in his community, the health officer will do well to stimulate organization of such a body by the governor, mayor, or city manager.

The health department can further promote the cause of accident prevention by improving collection of data on accidents. Correct entries on the death certificate, particularly place of accident, should be insisted upon. Follow-up studies of accidents by an intelligent agent equipped with a carefully worded schedule, are likewise needed. The Bureau of the Census has recently issued such schedules in provisional form.

Once let the health department become accident conscious, and other modes of attacking this problem will readily present themselves. The health officer who coöperates will find his efforts appreciated in gratifying fashion. The public is becoming aroused. Statistical bureaus report that more inquiries are received for accident statistics than for all other vital statistics combined. A real opportunity lies before the health officer. He should take action promptly and vigorously.

Finally, the program committees for the next annual meeting of this Association will do well to arrange for thorough discussion of the nature of the accident problem and of the program for solving it.

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PUBLIC HEALTH EDUCATION*

"Panic, Publicity and Polio"—Under this title, *Journal of A.M.A.* (Sept. 18, 1937) discusses past and present panics over disease. Suggestive comparisons are made with more widespread "crippling" diseases which do not arouse panic.

As to the present:

Before the people of the country at this time, preventive medicine presents a lamentable aspect. Many health officers, following the lead of Chicago, are delaying the opening of schools. It is not clear whether this creates or allays panic. Some health officers are publishing day by day lists of cases actually diagnosed—with large lists of those suspected of having poliomyelitis. This enhances the panic. In other communities health officers have announced that they will not delay opening the schools or close the schools, since this seems to be contrary to fairly well established public health practice. In 1932 the health officers of Boston, San Francisco, Philadelphia, Los Angeles, Cincinnati, and Chicago declared themselves opposed to delaying the opening of schools and to closing of schools to prevent epidemics of infantile paralysis. Similar views were expressed by Sir George Newman, Minister of Health in Great Britain, and by the Medical Director in the Department of Social Affairs of Oslo, Norway. Certainly there has been no new information or evidence since 1932 to warrant a change of opinion. There has only been new emphasis on poliomyelitis and perhaps too much publicity. Without the overemphasis in the press the vast majority of people would not have been concerned by the few hundreds of cases among many millions of people.

From Canada we get a point of view expressed editorially in *Health*, Health League of Canada, 105 Bond St., Toronto, Ont. (Sept., 1937):

There are lessons to be learned from the public interest in an epidemic of this type which go far beyond the control of this particular disease. There is a peculiar quirk in human psychology which seems to demand the dramatic. An epidemic of poliomyelitis seems to be in the same class as the sinking of a Titanic because to some degree the circumstances are similar. Yet the sudden dramatic death in an epidemic is not the only death. Unheralded and unsung, death has her daily victories without benefit of publicity. As a result of our failure to realize that most illness is preventable and most deaths are postponable, if not preventable, we fail to set preventive machinery in motion. It takes an epidemic to stimulate us to even consider the simplest of hygienic precautions. We drink unpasteurized milk and eat without washing our hands simply because we have not been frightened into doing anything else. . . .

People are disturbed about infantile paralysis and anxious to do something about it because the necessary educational work has been done—largely by the press. But they continue to disregard preventable though more serious maladies because the necessary educational work has not been done.

One sometimes hears criticism of publicity with reference to epidemics because it may create panic. There has been no evidence of panic in connection with the present epidemic; only a lively but healthy understanding of a serious situation, followed sooner or later by sensible moves in the direction of prevention. This is as it should be. Perhaps if it were possible to create a similar psychological reaction with reference to other death dealing maladies action would be as prompt. Naturally it would be more effective because there are many causes of death and disability both in the young and the old which are better understood than that which at the moment has succeeded better than the others in capturing the public imagination.

138,660 in One Month—September 1, 1937, the *Canadian Press* sent out the following:

Daily showings of the Dionne quintuplets will be cut from 2 hours to 1 hour, starting Sunday, September 12, it was stated today. They will be seen in their nursery playground from 9:30 A.M. to 10 A.M. and

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

from 2:30 P.M. to 3 P.M. Despite a falling off in attendance in the last week of August, about 19,000 more persons saw the children in that month than in July, figures released by Dr. A. R. Dafoe today showed. During August 138,660 persons in all saw the quintuplets.

Dr. Dafoe has written confirming those figures. Simple curiosity brought most of those visitors. We wonder what proportion of them have heard something about the precautions taken for the health of the children. Has the visit to the quintuplets deepened the educational impression?

We wish that some organization or individual would undertake to provide printed matter, telling of the health care of the girls, which might be given to all of the visitors. Could the national health services of the two countries provide this material?

Usually Capital Letters Are Bigger Not Better—Capital letters have been carefully and scientifically studied by psychologists who specialize in the advertising field. These investigators have found that capital letters actually slow down the reading, or at least the understanding, of what is read in print or in displays.

The one advantage that capital letters have is that they are usually made larger than the corresponding lower case letters. This of course is not an argument in favor of capital letters.

Every additional capital letter adds illegibility, and takes away something from the sense of readability.

Every Additional Capital Letter Adds Illegibility, and TAKES AWAY SOMETHING FROM THE SENSE OF THE READABILITY OF WHAT IS PRINTED OR DISPLAYED. Note how much easier it is to read *this* sentence, and how much more interesting it looks as you glance over this paragraph in contrast with the preceding sentence.

The Past Chairman Speaks—The new ex-Chairman of the Public Health Education Section, Homer N. Calver, was requested to supply several last paragraphs addressed to our readers. Here is his reply:

The only message I have is to thank all of the Section officers, Council members, committee chairmen and members, and members of the Section, their friends, guests, delegates, the speakers, and all others who contributed to the success of our recent meeting. There was an unbelievable amount of time and effort spent on the many features of this meeting and it was this capable, voluntary service on the part of a large number of people that made possible such an interesting and valuable occasion.

The 1937 Health Education Institute—Extracts from a report by Chairman Ira V. Hiscock:

Sessions were held Sunday, Monday, and Tuesday.

Nearly all of the 186 registrants were counted as present in each of the 5 periods, with the exception of Sunday afternoon when the attendance dropped to about 145.

"In addition to the 10 leaders of the various courses and the director, there were 21 assistants or consultants, 8 additional members of the courses who gave summaries (5 minute high points) during the final general session, an educator who discussed psychological principles in the opening session, and a health officer who gave the final address on the rounded program of community health education. There was active discussion from the floor in most of the sessions. . . .

"This committee believes that the desirability of a Health Education Institute in any year should be carefully considered. The frequency, time, and nature of program of an Institute are factors which require much study. The possible effect of the Institute on the regular section program should also be weighed."

Health Workers Have Hobbies—An innovation at the New York meeting of the A.P.H.A. in October was a hobby display. It was limited and was tucked away in the farthest corner of the ballroom mezzanine so that many failed to see it. There were street car

transfers of former days, some historical documents, wooden replicas of several first vehicles in health work, and gourds.

In the social hour of the Public Health Education Section a group of hobbies were described by their riders.

Following the convention, Charles Lorenz, Springfield Gardens, N. Y., sent in a transfer dated April 26, 1908, with a "consumption in early stages can be cured" message on the reverse side from the Committee on Prevention of Tuberculosis of the New York Charity Organization Society.

We hope that the hobby show may become an accepted feature of the Annual Meeting. And why not in state and local groups?

Make Your Exhibit Say "Stop! Look!"—Under this title Rose-Marie Kronmiller in *Farmer's Wife Magazine,* St. Paul, Minn. (Aug., 1937), tells how to do just that.

If you carefully analyze exhibits you will discover what principles underlie all good ones. Passersby do not stop to consider why an exhibit is appealing; they just like it or don't like it. But a study of the planning which should come before every exhibit will reveal why the exhibit "takes."

Why do exhibits appeal? Human nature is always the same—we like color, order, simplicity, humor, and beauty, and we want our education sugar coated!

Whoever is chosen to head up an exhibit should have originality, be resourceful, and be able to imagine how the completed display will look.

If you have been assigned to work out an exhibit, get all the facts about your space. Jot down its measurements and any peculiarities, as pipes, beams, or fixtures.

Decide upon a theme or main idea for your display and stick to it. Always remember that one good important topic is far better than a maze (or mess) of many ideas.

Make a center of interest in your booth, located about the middle of the space and near eye level. The lines of all printing, all decorations, and figures should tend to go toward this center of interest. You can focus attention by gay color; unusual features, such as cartoons; attention-getting facts; radiating lines; motion, as a circular placard which moves slowly on a pivot; sound, as a victrola record or talk by a booth attendant.

Keep everything simple. You are striving for effect, not perfection of detail. Select plain, neutral, fairly light colors for the backgrounds. Use lines which are rhythmic, and restful; lettering, figures, and objects which are in harmonious proportion. Achieve a feeling of balance, whether the exhibit is seen close or at a distance. Thorough cleanliness should radiate from the exhibit, especially if a foods theme is emphasized.

Something New in Exhibits—We have not seen the exhibit here described but it sounds like a grand idea. It does seem that 12 minutes is a long time to hold a standing audience, but this exhibit may have the pull to hold people that long.

The description appears in *Health News,* State Dept. of Health, Albany, N. Y. (Aug. 30, 1937):

Six major public health problems—the control of cancer, tuberculosis, syphilis, and pneumonia, the care of crippled children, and the reduction of neonatal deaths—are presented in a series of 6 panels in crescent shaped arrangement, 3 on either side of a motion picture screen. A "telephone operator" seated before a "switchboard" and speaking into a "transmitter" announces the problem to be discussed. When she "plugs in," a sound motion picture illustrating the subject is started. At the close of the minute and a half that the picture runs, the operator throws a switch which illuminates and animates the corresponding panel. Each of these 6 panels is shown successively. The demonstration of the entire series takes about 12 minutes and is repeated after a brief pause. The work of filming and adding sound to the motion pictures was done by the Division of Public Health Education.

At Connecticut County Fairs—From *Weekly Health Bulletin,* Conn. Dept. of Health (Sept. 7):

For many years the khaki-topped tent of the State Department of Health has taken a prominent part in midway activities at agricultural fairs in Connecticut. The time

is approaching when it will have to be shaken free of its winter folds once again and put into active service in the fair circuit. The two state flags will be unfurled to Connecticut breezes at the top of the tent poles. These state flags proclaim to the midway throngs that in their midst is something a little different in midway attractions, something which belongs to them and has been placed there for their benefit.

Ordinarily such an exhibit would not fit in well with the gala spirit of the occasion, but parents have learned from previous experience that the health information they can secure in the State Department of Health tent is valuable. They like to see whether their children have made normal gains in weight during the summer months, and to discuss with those in attendance the matter of food for young children and, what is more important than anything else, how to get them to eat it.

Free health movies will be shown at each of the fairs and the health message thus graphically portrayed will be fixed more firmly in their minds. To make this message lasting, there are health leaflets to be taken home and read at leisure. These will give added assurance in health measures to be adopted.

The health exhibits this year will include one on undulant fever, a disease unknown in Connecticut until a few years ago but one that has been increasing rapidly.. This exhibit will point out the fact that undulant fever in man, caused by the same germ as that causing Bang's disease or contagious abortion in cattle, is the result of drinking raw milk from infected herds. It will show the epidemiological methods used in tracing the source of the infection, and the advisability of having milk pasteurized and the herd tested for Bang's disease.

During the last 14 years the State Department of Health has sent health exhibits to 120 fairs in the state, or an average of about 9 fairs each year, 175,000 people having been reached.

Panel Discussions—The panel or platform discussion group is an effective method for talking over a difficult topic, that is, if the panel technic is not mutilated. All too frequently a "panel" means a group of speakers who make a series of short talks.

"Progressive education" groups have led in the introduction of the panel method into many schools. We give extracts from "Panel Discussions for Junior Red Cross Councils" in *Junior Red Cross Journal,* Washington, D. C. (Oct., 1937):

The Purpose of Panels: A panel is an organized conversation among the members, often with some participation on the part of the audience, with the object of bringing out all sides of a problem and arriving at a constructive course of action and thinking. The object is not, as in formal debate, to prove the superiority in argument of one team or individual over another.

Members of the Panel: A chairman; 3 or 4 members who present special phases of the subject; several other members who, because of experience or study, are qualified to enter into the conversation by questions and answers.

Responsibility of the Chairman: The chairman should see that the members are seated advantageously. Chairs are usually grouped either in a semicircle or about three sides of a table facing the audience. The chairman opens the discussion by introducing each speaker, telling who he is and what his special qualifications are. As he calls on them, he may again incidentally repeat not only names but something about their qualifications. The chairman keeps the discussion moving, encouraging the more reticent, draws out audience participation, and acts as referee if necessary.

Responsibility of Members: Those members who have been assigned special phases of the topic must be prepared through experience, investigation, and reading to present their special part of the subject in a 3 to 5 minute presentation when called on by the chairman to do so. Such preparation makes possible a helpful asking and answering of questions, also, as the discussion unfolds. The members who do not have special assignments are chosen for a general familiarity with the topic, and their ability to follow the discussion and help to keep it moving forward. All members need the ability to follow the argument, see the point quickly, and avoid dragging in irrelevant matter.

A Panel on Relief: The article on relief in this issue of the Journal may be used as the basis for a panel discussion. Someone who has informed himself about the extent of the local relief problem by interviews and reading, can present the essential facts. Other members may include representatives of the following points of view:

1. Administration of public relief

2. Private welfare workers
3. Local taxpayers
4. Employment agencies interested in getting those on relief back into private employment
5. Private employers, concerned with the efficiency of the workman, and unwilling to accept on their payrolls the indifferent or shiftless
6. The people on relief, perhaps someone who has actually tried out living on a relief budget as Tom did

The 3 to 5 minute talks suggested above merely help to focus the conversation of the group. The conversation which *is* the panel discussion represents a group interested in learning and in contributing information and ideas. It is conversation which sticks to a chosen topic without excursions even into related topics which might take attention from the main topic and the selected sub-divisions of it.

Group Discussion of Accidents—A 79 page (letter size page) pamphlet of the American National Red Cross, Washington, D. C., presents "Group Discussion Material on Accident Prevention in the Home—On the Farm." There is a wealth of reference data and of suggestions for handling the 6 topics, which would seem to call for more than 6 sessions.

"This Group Discussion Course on home and farm accident prevention has been prepared for any group of people interested. It is specifically suited for meetings of the Grange, Farm Bureaus, Home Demonstration Clubs, 4-H Clubs, Future Farmers of America, Women's Clubs, Parent-Teachers' Associations, men's organizations, civic and fraternal groups.

"The group discussion method is recommended. The success of the course depends largely on the leader's resourcefulness in stimulating the members of the group to participate in discussions and other activities. This helps not only in retaining their interest, but also to shape their convictions, which are indispensable for individual and social action to prevent accidents at home, on the farm, and in the community. The laboratory method is also recommended. Each member of the group should be induced to experiment with conditions in his home and on the farm that constitute possible accident hazards and to report to the group on results achieved.

An outline of the outline for the second topic, "Falls":

Leader reviews previous discussion . . . Leader announces subject for this session . . . Group members report on falls experienced at their homes and farms . . . Leader presents other typical accident incidents . . . Leader presents some accident statistics in falls ("The Greatest Home Hazard," "The Most Dangerous Age," "The Most Dangerous Room at Home") . . . Group discusses local and state statistics . . . Leader presents a symposium of things to do . . . Group discusses what should be done today; what should be planned today; what habits should be formed . . . Leader assigns members of group to report on home and farm experiences for the next topic.

This question was raised by one health educator who examined this handbook: "I wonder about the psychology of dwelling on gruesome details of accidents in a series of 6 meetings."

The plan, including the provision of varied illustrative material which we cannot take space to describe in detail, suggests an application to other health topics. We would suggest the inclusion of more information about handling discussion. It would seem wise to outline the sessions in a way to encourage more intensive discussion of a limited range of material. The highly desirable group discussion tends to become hop, skip and jump when a wide range of material is offered for consideration.

The People Require to Be Told—Let's read the concluding paragraph of "Relationship of a Rural Health Program to the Needs of the Area," by Dr. Joseph W. Mountin, in *Public Health Reports* (Sept. 10, 1937):

It would appear from the study that health department programs are developed on the assumption that the people require most of

all to be told what is necessary for health. The programs are not designed to cope with those barriers that may so effectually prevent a people from obtaining those things which they need.

In many respects the county health officers, and rural health workers in general, have resources for health education beyond the reach of the city health worker. In the city there can be no such range of personal contacts, and such possibilities for volunteer coöperation as may be found in the smaller communities.

The weak point is in the training of the health worker. There is art as well as procedures and materials in the use of contacts and of volunteers. It calls for a rare type of teacher in public health training schools to help the county and rural workers to learn how to reach their people.

For Conventions as Well as Staff Meetings—When papers are read or talks are made the audience would be happier if the platform should follow the suggestions given below. Some such paragraphs might be printed or mimeographed for the use of all who appear on the programs. Of course the material would be good for use in staff and other house organs.

The suggestions which follow are quoted from *Food Inspector,* New York City Dept. of Health (Aug., 1937):

The bi-monthly pay day meetings (of inspectors) continue to result in some excellent and informative talks on a wide variety of public health topics; the talks given have all been carefully prepared and it is evident that many hours of hard work have been devoted to their preparation. Unfortunately these talks have not been as interesting and effective as they should be. Several outstanding faults that are extremely noticeable are:

1. Most of them have been entirely too long; no one but a finished orator can hold an audience's attention for much more than 15 or 20 minutes.

2. The voices of those reading the report have often been indistinct, the delivery monotonous. Papers have been read rapidly in order to shorten the time, making it difficult to take notes.

3. Construction of sentences and correct grammatical usage has not always been adhered to.

4. The attempt to cover comprehensively an entire field has placed the speaker at a disadvantage. By using all his material in the paper he has kept nothing in reserve for discussion during the question period.

The ability to stand up and state simply and effectively the message you have to deliver is not one that can be acquired in a short time and requires as much study and preparation as the paper itself. A few suggestions offered:

1. Limit yourself to the most important phases of your subject.

2. After you have written your paper, cut it down as much as possible and time yourself so that the entire reading will not be more than 20 minutes.

3. Jot down notes on the probable questions that will be asked and be prepared to answer them.

4. Inform yourself fully on your subject —well beyond the actual substance of your paper.

5. Use care in the selection of good English; avoid grammatical errors.

6. Read slowly and distinctly; look at your audience.

7. Remember that extemporaneous speaking is more interesting to the listener than a written paper—*if you have the ability to* speak in that way. In general suggestions for the preparation of a paper as made by the Acting Director should be complied with.

Health Education in the Newspapers—In the course of several issues we plan to reproduce samples of typical syndicated material which appears widely in newspapers of Canada and the United States.

This month we sample the Associated Press health column edited by Dr. Iago Galdston.

Associated Press Feature Service —"How's Your Health? Edited for the New York Academy of Medicine by Iago Galdston, M.D. (For Nov. 10.) Colds Prevention—I."

There is much that we can do toward pre-

venting colds and minimizing their severity and complications, even though we aren't yet able specifically to prevent colds.

At present it seems to be quite clear that the common cold is essentially due to a filterable virus—an extremely minute disease-producing agent, too small to be visible even under the most powerful microscope.

Coöperating with the filterable virus are a number of germs (visible under the microscope) which apparently are enabled to set up the inflammatory reactions associated with colds in the tissues previously weakened by the filterable virus.

A cold, therefore, may be thought of as a diseased condition produced by a mixed infection—that is, by a filterable virus and a variety of germs. Knowing this fact will help make clear why we use bacterial vaccines in the attempt to prevent colds. It should also clarify the promise that in the near future we may have a specific virus vaccine against the responsible cold virus.

Since the common cold is an infectious condition, the first item in its prevention is avoidance of contact with the responsible infectious agents. This, of course, is not easy to attain, for in our everyday activities we must come close to individuals who suffer from colds and must handle a variety of objects that are likely to be contaminated with the cold infectious agents.

Even so, we can avoid gross contamination. For it is well established that the body can protect itself, even against highly virulent germs, provided the dose of infectious material is not too great. The surgeon practising careful asepsis knows what scrupulous care he must exercise in keeping himself, his instruments, and the field of operation free of bacteria.

The average person, however, is not likely to be fully impressed with the value of "attention to details," such as: covering his mouth and nose when he coughs and sneezes; not shaking hands with those who have colds, or with others when he himself has a cold; washing his hands before eating; keeping his hands away from his lips and his mouth; and not putting objects that don't belong there into his mouth.—*Tomorrow—Colds Prevention*—II.

Hygeia, November, 1937—Material to be quoted, background, titles in *Hygeia*, 535 N. Dearborn St., Chicago, Ill., November, 1937, *25 cents:* Some fallacies about cancer . . . Stop annoying your child (with a mental health "annoyance test") . . . What light for the eyes? . . . Nursing in the home . . . Should cousins marry? . . . Riding for health . . . Clean sports (sanitation) . . . New Orleans Charity Hospital . . . Bad habits in good babies . . . Cancer "cures" and "treatments" . . . How clean is your house? . . . X-rays in sciences and arts . . . Sportsmanship preferred ("the poor little rich boy") . . . 80,000,000 meals! (WPA and underprivileged children) . . . Conserve the child's hearing . . . Thomas Addison ("an acute medical investigator") . . . The cows that had tuberculosis (in story form) . . . New books on health . . . Questions and answers.

In "School and Health":

Building the health curriculum in the high school . . . Conserving energy for growth . . . Survey of a health education program (Ontario, Calif.) . . . The school physician with initiative . . . All in the day's work . . .

"A New Radio Program for Schools" includes topics of the weekly A.M.A. broadcast. This is given over NBC Red Network from 2:00 to 2:30 P.M. (E.S.T.) on Wednesdays. "Suggestions for Teachers" includes teaching outlines, reading references, and suggested projects. Reprints of this section for use in the schools, 25 copies at *50 cents*. Single copies, *5 cents*.

City Health Conservation Contest—In the Fact-Finding Schedule health education is represented under "Community Interest and Education":

1. Is an annual report of health department published? How many copies are distributed? To whom?
2. In what manner and to what extent do local newspapers assist in health education? How many articles sponsored by the health department appeared during the year 1937?
3. How many pamphlets on health were distributed during 1937?
4. How many lectures and radio talks on health were given during 1937?
5. How many moving pictures on health were shown during 1937?
6. What organized plan of education and control is carried on to effect the prevention of auto accidents?

A Syphilis Poster for Sale— For those who use bill board posters it is a real event to find a good one available throughout the country.

We illustrate a 24 sheet poster developed by the New York State Committee on Tuberculosis and Public Health of the State Charities Aid Association in coöperation with the State Department of Health. Both the national and the New York state outdoor advertising associations have officially approved the poster, and have agreed to coöperate in providing free space and posting service.

Of this poster State Commissioner of Health Edward S. Godfrey, Jr., says:

> "The eradication of congenital syphilis is predicated in large measure upon the early diagnosis and treatment of the syphilitic expectant mother. By emphasizing the need for careful physical examination and blood testing early in pregnancy, this poster should be a material aid to health agencies and officials in their efforts to secure complete coöperation of the people in preventing the prenatal transmission of this disease."

For sale in the United States and Canada, delivery early in 1938, at $1.50 a poster, plus shipping charges. Write to State Committee on Tuberculosis and Public Health, 105 E. 22d St., New York, N. Y.

The direct message, in the lower box, is so worded as to be especially effective, as indicated by Dr. Godfrey. We wish that the artist had been induced to letter "Born" along with "Healthy" on the second line. Thus the *full* force of the top message would be more sure to reach the rapidly passing automobile reader.

DATES AHEAD

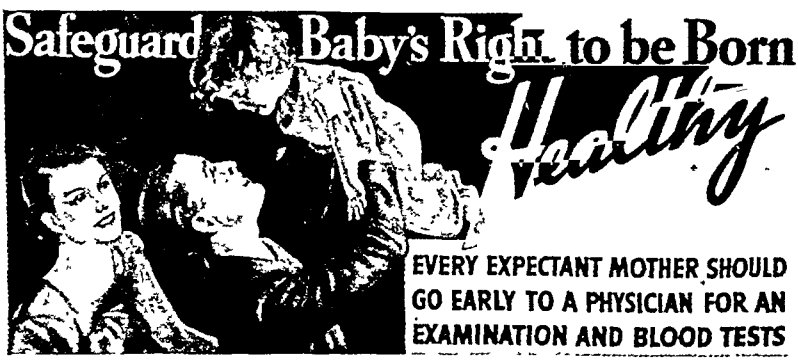
Do we have a "Dates Ahead" file? A set of 12 folders, one for each month? And do we drop into those folders any clippings or memoranda which may be ready for consideration as needed? Christmas and the holidays period may give point to selected health messages.

Some departments and associations have given a holiday touch to their house organs. Some have issued Christmas greetings. In this connection good use has been made of the office mimeograph or multigraph.

The *first day of winter* is Dec. 22 this year. It may be made an accent point.

The health department may well be represented in local community affairs. And if "everybody is doing" something or other may not the health agency staff be included?

Jan. 21, 1938, is the closing date for the *Gorgas Essay Contest.* This is open to third and fourth year high school students. Your high school may not have learned about this contest. Or, you may be able to help in providing reference material. For full



details address Gorgas Memorial Institute, 1835 Eye St., N. W., Washington, D. C.

Please send to the editor any dates you will utilize, any topics for certain months, any ideas for carrying health messages through the calendar.

FOR EDUCATION AND REFERENCE

"Blindness Prevention." Review of the field. National Society for Prevention of Blindness, 50 W. 50th St., New York, N. Y. 6 pp. *5 cents.*

"Ten Questions the Intelligent Citizen Should Be Able to Answer Regarding the Federal Housing Act of 1937." National Public Housing Conference, 112 E. 19th St., New York, N. Y. *Free.*

"Watch Out for Scarlet Fever." Line cuts and limited words. State Dept. of Health, Albany, N. Y. 6 pp.

"What You Should Know about Eyes," by Park Lewis, M.D.; "Venereal Diseases," by William F. Snow, M.D.; "Exercise and Health," by Jesse Feiring Williams, M.D. Three titles in National Health Series, edited by National Health Council, published by Funk and Wagnalls Co., 354 4th Ave., New York, N. Y. New or 1937 editions. *40 cents* by mail, 3 for *$1.10.* Cloth bound, 4 by 6 inches, 70 to 100 pages. A series to be pushed where there are opportunities for selling to those who will read a small book. For sale by A.P.H.A. Book Service.

A.I.C.P., 105 E. 22d St., New York, N. Y.:

"Family Health Series": "Child Development"; "Syphilis"; "Tuberculosis"; "Cardiac Conditions." Small, planagraphed pamphlets for use of nurses in teaching families. Single copies, *6 cents.* Low rates in quantities. Have been translated into Japanese and Spanish. Available in Japan and Cuba.

American Medical Assn., 535 N. Dearborn St., Chicago, Ill.:

"The Truth About Acidosis." 2 pp. *5 cents.*

"Diabetes, Doctors and Dogs." 8 pp. *10 cents.*

"Dental Nostrums and the Public Health." 30 pp. *10 cents.*

"A New Radio Program." Folder. *Free.*

American Social Hygiene Assn., 50 W. 50th St., New York, N. Y.:

"Prostitution in the U. S." 18 pp. *10 cents.*

"Medical Social Service in Syphilis Clinics." 5 pp. *5 cents.*

"Social Hygiene Education in a City of Medium Size." 18 pp. *10 cents.*

"What You Should Know About Syphilis and Gonorrhea." 72 pp. *15 cents.*

Massachusetts Dept. of Public Health, Boston:

"Are You As Attractive As Nature Intended You To Be?" Score yourself and see. 4 pp.

"Vitamin C Foods Each Day." 4 pp.

"Food Wise—Money Wise." Food budgeting; and information sources. 15 pp.

From State Board of Health, Dover, Del., two items which don't look like health department publications. "To the Expectant Mothers" is a small folder, readable in appearance . . . "Some Thought for Food" is a booklet, larger page. It quotes Dr. Sherman on "an optimum diet," but does not explain what an "optimum" is. "The Pattern Menu" is an interesting idea. To one reader the column headed "Daily Pattern," part of a two page spread needs further explanation to make clear its relation to the adjoining columns showing light and medium menus. "Fats," "Sweets," etc., appear under "Daily Pattern," but not under "Light" or "Medium" menus for any of the three meals for the day . . . Delaware also has small folders on syphilis and gonorrhea, inexpensive but readable.

LISTS OF PUBLICATIONS

"Health Education Publications." National Education Assn., 1201 16th St., N. W., Washington, D. C.

"Health, Diseases, Drugs, and Sanitation"; "Animal Industry, Poultry and Dairying"; "Foods and Cooking." Lists of government publications. Supt. of Documents, Washington, D. C. *Free.*

"Health and Medical Economics"; and "Hospital Housekeeping and Management." Lists of free or inexpensive materials. *American Journal of Nursing,* 50 W. 50th St., New York, N. Y. Sept.-Oct., 1937. *35 cents* each.

"'NOPHN' Interpreted." A dialogue in a Pullman car in which specific publications of NOPHN are linked with situations and problems. *Am. Journal of Nursing,* 50 W. 50th St., New York, N. Y. Sept., 1937.

MAGAZINE ARTICLES

A minor, but exceedingly useful health education opportunity is offered in the health articles in periodicals.

A first use for them is to bulletin new articles to the health department or health association staff. Use the bulletin board, the staff house organ, or a simple mimeographed sheet.

Familiarity with the current articles will enable staff members to do more talking on current health topics in their personal contacts. Many times there will be natural opportunities for staff members to refer to one of the current articles.

Again some of this popular material may show staff members how to make annual reports, talks, articles, folders more interesting and effective.

Staff members may be invited to report magazine articles to supplement the lists appearing in this department.

"It was the most delightful piece of twaddle I've read in a long time," said Dr. Francis Carter Wood, as reported by New York *World-Telegram,* referring to the magazine article, "Is Milk Cancer's Ally?"

"The Modern Method of Birth Control," by Dr. T. S. Welton. Book condensed in *Book Digest,* 350 East 22nd St., Chicago, Ill. Aug., 1937. *25 cents.* Cycle or rhythm control.

"Carelessness: Public Enemy No. 1," by C. Wood, condensed from the book. *Book Digest.* Oct., 1937. *25 cents.* Automobiles, fire industrial accidents, and disease.

"By Popular Request." Editorial. *Colliers.* Birth control in many countries. The A.M.A. action: "The doctors did not advocate or oppose birth control. They merely recognized a fact"; "Keep Cool," by Dr. V. G. Heiser. ("See that you are ventilated, and not too well fed." Some experiments in the tropics.) *Colliers.* July 17, 1937.

"Thou Shalt Not Kill," by J. T. Flynn. *Colliers.* Highway tragedies as reduced in Nashville, Evanston, and Milwaukee. Sept. 4, 1937.

"What Do You Pay for Speed?" (editorial), and "The Rats Said Yes" ("hope to millions of beriberi sufferers"), by J. D. Ratcliff. *Colliers.* Oct. 9, 1937.

"Bathing Your Way to Beauty," and "When They Get Colds." *Farmer's Wife,* St. Paul, Minn. Nov., 1937. Copy *free* to health workers.

"American Medical Association and U. S. Public Health Service Join in Syphilis War With Movie" (a page); "The Frontier Service Brings Health to Kentucky Mountaineers" (4 pages); "Hygiene Exhibit Models in Vienna Show How Man Sees and Hears" (giant reproductions). *Life,* 350 East 22d St., Chicago, Ill. *10 cents.*

"Millions Suffer from These—Hay Fever, Asthma, Hives—What Causes Them and How Science is Treating Them." 6 pages of pictures and captions with a circulation of 2,000,000. *Look,* Des Moines, Iowa. Aug. 17, 1937. *10 cents.*

"English Children Learn How to

Drive Safely" (devices used with school children); "Giving Premature Babies a Chance to Live"; "Bone Carpentry"; "Ozzie," the car driving menace; "The Story of a Kiss" (and its health danger); etc. *Look*. Sept. 28, 1937. *10 cents*.

"Science Comes to the Aid of Crippled Children" (2 pages); and "Street Corner Drama: Who Caused the Wreck?" (2 pages). Also 4 pages on civil liberties. *Look*. Oct. 26, 1937. *10 cents*.

"Do You Know That the U. S. Has the World's Worst Slums?" (6 pages). *Look*. Nov. 9, 1937. *10 cents*. The picture magazine with 2,000,000 circulation makes far reaching contributions to health education.

"Keeping (the child) Cool in Hot Weather," by W. H. Irwin. "A (junior high) School Becomes Safety Conscious," by D. Osborn. *National Parent-Teacher*. 1201 16th St., N. W., Washington, D. C. July, 1937. *15 cents*.

"Lifesavers of the Bush," Sir James Barrett (nursing on Australia's frontier); "Safety Work at the Crossroads," by A. W. Knight (roadside first-aid). *Rotarian*, 35 East Wacker Drive, Chicago, Ill. Aug., 1937. *25 cents*.

"How it Feels to Look Like Everybody Else," by J. Alsop, Jr. *Saturday Evening Post*. Sept. 11, 1937. Reducing by dieting.

"Health Talk." Editorial. *Saturday Evening Post*. Sept. 18, 1937. Against "indiscriminate tooth pulling" and single answer health panaceas. "A Job for the States." Editorial. School building safety calls for legislation.

NEW

Chicago V. D. Bulletin, U. S. Public Health Service in coöperation with Illinois Dept. of Public Health, and Chicago Board of Health. The Oct., 1937, issue (No. 4) includes a description of the educational and medical features of the "Chicago Plan for Venereal Disease Control" which has received widespread newspaper attention.

At least new to this department is *The Food Inspector* (we have just seen No. 2 of Vol. 3), a quarterly issued by the Food Inspectors Assn. of the New York City Dept. of Health. "Timely notes, abstracts of current literature and news published for inspectors of Bureau of Food and Drugs"; 17 letter size pages.

EXHIBITS

A happy example of adaptation of an exhibit to the audience is described in *Health News*, State Dept. of Health, Albany, N. Y. (Sept. 20, 1937):

> An exhibit illustrating the leaflet on "Food and Health from Wild Greens or Pot Herbs in New York State," published by the State Department of Health, has been built by Mrs. Catherine Wood Davis, executive secretary of the Essex County Tuberculosis and Public Health Association. It was designed following the suggestion that garden club flower shows might provide opportunities for health exhibit material.
>
> The display is in three sections with the center panel featuring the name of the leaflet. The other two panels portray specimens of edible greens found this summer in the country. Dr. H. D. House, state botanist, furnished identification for many of the plants. The specimens were pressed, mounted with transparent tape, labeled, and then illustrated with clippings taken from the greens leaflet.

"The Scientific Exhibit, 'The Story of Life,' At the Texas Centennial Exposition, Dallas, Tex., June 6–November 29, 1936" is the title of a 28 page pamphlet with pictures, descriptions of the exhibits, and some conclusions submitted to future exhibitors. Supt. of Documents, Washington, D. C. *10 cents*.

Exhibits presented by American

Medical Assn. in October, as reported in *Journal of A.M.A.:*

Health Week under the auspices of the Fort Wayne Medical Society and Y.M.C.A. officials, Fort Wayne, Ind. Exhibits on The Human Factory, Individual Health and Heart Disease.

Annual Meeting, Vermont State Medical Society, St. Johnsbury, Vt. Exhibits on The Doctor Prevents Disease, Basic Science Laws and Treatment of Early Syphilis.

Health Program sponsored by the Parent-Teachers Association, Rocksprings, Tex. Exhibit on Posture.

County Fair, Tarboro, N. C. Exhibit on Syphilis.

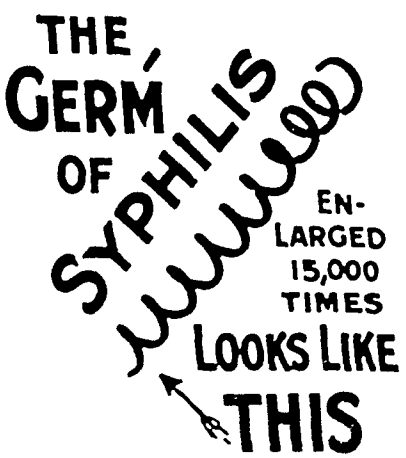
Joint Meeting of Medical Society of the County of Nassau and the Nassau County Cancer Committee, Mineola, N. Y. Exhibit on Cutaneous Granulomas.

Annual Session, American College of Surgeons, Chicago.

Teachers' Convention, Omaha. Exhibit on Health and Hygiene under the auspices of the Omaha-Douglas County Medical Society.

Kent-Sussex Fair health exhibit included syphilis, as described by Mary E. Thomas in *Delaware Health News,* State Board of Health, Dover, Del.

A white plastacele rod, twisted into a regular spiral, mounted on a black satin-finished board and flanked by, "The Germ of Syphilis, magnified 15,000 times, Looks Like This," forcefully drew the attention of Fair visitors and told them the booth below was part of the national fight against the "racial killer."



Brightly executed and smartly illustrated exhibits within the booth advised that "Syphilis is a Disease, Not a Disgrace," "Syphilis Wrecks Marriages," "Syphilis Strikes One Out of Ten Adults," "New Cases of Syphilis and Gonorrhea Lead in Delaware," "10.28% of Insanity in Delaware is Due to Syphilis . . .," untreated syphilis in expectant mothers will cause disastrous results to 83% of their babies, and "Scandinavia Conquered Syphilis—So Can We!" Strong, shaded lights washed attention-drawing illumination across the displays, while sufficient white space between exhibits gave an atmosphere of cleanliness and spaciousness.

A "Peep-Show for Education on Syphilis" is described in *Monthly Bulletin,* Indiana Division of Public Health (Oct., 1937). This was shown at the State Fair.

A gruesome, hooded figure made from wallboard, holding in its hands an enlarged photograph of a new-born syphilitic baby, is the background of the exhibit. It is collapsible so that it can be transported by automobile. An interesting series of 6 illuminated transparent photographs illustrate the exhibit. In addition, an automatic balopticon machine is used which shows 26 lantern slides on the subject of syphilis, on a daylight screen. The photographs in the boxes are illuminated by 30-watt lamps and are viewed through an oval-shaped opening about 6 inches in diameter.

The effect of the exhibit is particularly impressive because the message emphasizes the importance of early diagnosis and adequate treatment for syphilitics. The explanations carried by the photographs graphically illustrate the series. The condition of the patient is described on a placard beneath each opening on the separate boxes. The spectators read the inscriptions on each box in the following order (here are two samples):

1. "This man acquired syphilis. He is shown in the secondary stage of the disease. Treatment begun when a sore first appeared would have prevented this stage from developing."

2. "This is a picture showing the sores that have developed on his tongue. He is a dangerous individual and a real threat to anyone with whom he comes in contact."

The Tranquille Tuberculosis Society

won a first prize for its float in the Kamloop, B. C., 125th Anniversary parade. A "S. S. Good Health" was built around a farm truck. A float costing less than $10 won a third prize for Saskatoon, Sask., Sanatorium. Both are illustrated in *Bulletin*, Canadian Tuberculosis Assn., Plaza Bldg., Ottawa, Ont. Sept., 1937.

An almost wholly new exhibit was shown by Illinois State Dept. of Public Health at the Illinois State Fair. Among the displays were the following:

Health Beacon. A towering beacon light, 7 feet high and 2 feet across the base, portrays the principles upon which preventive medicine is founded and the steps of progress in the control of various diseases.

Age Hazards. A series of 14 beautiful oil paintings show the principal hazards encountered during each 5 year period of life by each sex up to age 50 and point out the methods of controlling the hazards.

Industrial Hygiene. Depicts the various occupational hazards found in Illinois and shows how to control them. The mechanical devices used to determine the amount of dust and gas in the air, masks, goggles, and dust collectors, charts and drawings that indicate the potential risks to health in various industries will be shown in this exhibit.

Syphilis. Perhaps the most striking and impressive of all the new displays, this exhibit utilizes automatic lighting, wax and celluloid models, portraits, artistic drawings, and posters to illustrate the prevalence, characteristics, treatment and means of controlling this serious disease.

Tuberculosis. A series of X-ray photographs showing healthy lungs and those with healed and active lesions in various stages of the disease will be displayed. Explanatory charts and posters illustrating important factors in the control program will be included.

Milk. An intriguing mechanical model portrays each step from the cow to the consumer in the production and handling of milk, emphasizing the many points at which contamination may take place and the importance of pasteurization as a safety factor. Charts and posters illustrating how greatly the sanitation of milk has helped in the control of disease will supplement the model.

Sanitation. Models, maps, transparent drawings, and sound movies will be used to show what has and what can be done to protect public and private drinking water supplies and dispose of human and industrial waste products in a safe, sanitary manner. Detailed plans illustrated by models on the construction of wells, sewage plants, and privies will be shown.

Epidemic Diseases. New exhibits on typhoid fever, diphtheria, smallpox, and rabies will show in detail how these diseases are spread, the degree of risk in Illinois and the means of prevention.

Dental Health. A pair of giant teeth, one a cross-section showing in detail the anatomical structure, together with illustrated panels will show the various factors concerned in the building and preservation of sound, durable teeth.

Maternal Hygiene. Models, posters, and charts will portray the important factors in providing good prenatal and obstetrical care and in preserving the health and lives of mothers and babies during the first few hours and days after birth.

The Health Education Coördinator

The possibility of advancing public health through the use of a well trained health education coördinators has been discussed for some time by leaders in the field, and was considered at a luncheon meeting of the Public Health Institute on October 4, 1937. This gathering of nearly 200 people voted unanimously to refer the project to the Council of the Health Education Section for action. The discussion as developed by Professor Turner, the Chairman of the meeting, and others speakers, brought out the following points.

1. Health education has proved its value in both school and community, and up to the present time these two phases of health education have usually been developed separately.

2. The increase in the number of Directors of Health Education in schools has been slow because the average school superintendent and his board do not feel responsible for the health of the community. They feel that the teachers can teach hygiene

without special supervision as well as geography. They think of special subject supervision, not of the possibilities of reducing morbidity through organized and concerted training in healthful living.

3. Workers in health education in schools are recognizing more and more the need for extending the program into the community for the best results.

4. Health officers are increasingly recognizing that the school through health education can further the public health program in immunization, sanitation, and disease control.

5. The number of health education projects in the community is increasing through local, state, and national stimulation to include cancer, syphilis, tuberculosis, diabetes, nutrition, and other health problems. As these activities increase in number there is greater need for their coördination.

6. In many local governmental units there is lack of coördination between the health department and the health program in the schools.

The Plan

The plan discussed involves the use of a health educator well trained in both health and education to be employed jointly by the school department and the health department with possible subsidy from the state department of health and the state department of education. The training of such a person involves the addition of instruction in publicity and popular health instruction to the program of work already set up for the director of health education in schools. Such a worker would divide his or her time between the public schools and the community program.

This is not a new or theoretical proposal but rather the reflection of a procedure which is gradually evolving from our experience in health education. The development of such a plan in connection with county health organization in Tennessee was reported by Dr. H. H. Walker. In Cattaraugus County, N. Y., in the Birmingham, Ala., area, in some of the rural counties in Michigan, in Hawaii and elsewhere we have seen highly successful programs of school health education developed in close coördination with the health department.

There are several possible benefits from the development of this type of organization: (1) The amount of first class health education service in the country is likely to increase through the initiative on the part of health departments and through the possibility of drawing upon two budgets for the employment of an adequately trained individual. (2) Increased funds for this work will commonly be available, not only because two local departments are drawn upon but also because of possible subsidies from the state and federal governments. (3) Training for health educators could be provided on the same basis that it is now being provided for technical workers in other phases of health department activity. (4) Such a plan will provide a continuing link between the school health education program and the educational work of the health department and private agencies in the community.

Many large governmental units will have a health educator in both the school department and the health department. Moreover, there is no thought that a rigid plan will be produced or urged for adoption by all areas. The plan would be flexible and adopted where local school and health administrators believe it to be useful.

The Health Education Section is organizing a committee to look further into this plan and is inviting committee participation from the Health Officers Section and from the U. S. Public Health Service.

BOOKS AND REPORTS

Health Under the "El", The Story of the Bellevue-Yorkville Health Demonstration in Mid-town New York—*By C.-E. A. Winslow and Savel Zimand. New York: Harper,* 1937. 198 pp. Price $2.25.

It was emphasized in early editions of Rosenau's *Preventive Medicine* that the trouble with public health administration in large cities was that it was too far removed from the people. *Health under the "El"* proves the logic of this statement and in a marked measure establishes the fact that the health center has become a most important local vehicle for the fostering of high standards of community health.

Health under the "El" is the well written story of the Bellevue-Yorkville demonstration, which was financed by the Milbank Fund, and set up to study the very best way by which health services might be rendered for 175,000 people residing in an area covering 50 city blocks in New York City.

An interesting chapter of the book is devoted to a picture of morbidity and mortality for this district preceding the demonstration, these figures revealing that the general death rate, the tuberculosis and the infant mortality rates, were higher in this defined area than in New York City as a whole. Refreshing figures are presented showing a picture of a marked improvement in all these fields, following the 10 year demonstration. Of particular interest is the picture of the development of improved interrelation among the health agencies of the district, and the assumption of increasing responsibility for the health program by the City Department of Health.

One of the most important declarations made is "that the things proven of value in this demonstration can be logically adopted beyond the environs of New York City and New York State." Ten years of sound experimentation in district health organization have strengthened the belief of those who are attempting to find out the very best way by which health services might be rendered in local areas, that the properly-functioning health center is a logical essential for the best kind of neighborhood health service.

This book is recommended highly to those who are interested in the furtherance of district health organization.

CHARLES F. WILINSKY

Milk Products—*By William Clunie Harvey, M.D., D.P.H. and Harry Hill. London: H. K. Lewis & Co. Ltd.,* 1937. 387 pp. Price, $5.00.

The authors of the excellent British text entitled "Milk: Production and Control" have produced a worthy companion volume on milk products, including ice cream, cream, butter and margarine, cheese, condensed and evaporated milks, dried milks, and various "subsidiary" milk products.

A standard pattern is followed in discussing these subjects, with valuable material on the definitions, properties, food value, bacteriology, epidemiology, processing, and legislative and administrative control of each product. The legislative material is, of course, mainly British, but the other facts are certainly of international significance.

The book is well printed and profusely illustrated. It has a good index,

but no bibliography. It should prove of practical value to all who are concerned with the production and control of the various dairy products.

JAMES A. TOBEY

Sixteenth Annual Report of Ohio Conference on Water Purification held at Columbus, Ohio, September 29–30, 1936.

The physiological effects of fluorides in water, together with methods used for its removal from Ohio water supplies, the corrosive action of various kinds of water on household hot water tanks, operating reports on several water works and various iron removal devices, and a suggested method for making water purification calculations were among the topics of papers read and discussed at the 1936 conference. Discussions on problems of interest to water works operators are given. An author and subject index of reports presented at these conferences during the past 15 years is also included.

F. J. MAIER

General Hygiene and Preventive Medicine—*By John Weinzirl; Edited by Adolph Weinzirl, M.D. Philadelphia: Lea and Febiger,* 1937. 424 pp. Price, $4.00.

This book has the merit of originality in approach. The author recognizes that there must be some valid excuse for another book on hygiene, so explains his ideas at some length. He approaches his subject from the standpoint of the methods employed to control disease and all other material is made subordinate to that end. He describes briefly a number of diseases with the object of "vitalizing" the particular method under discussion. The result of this is that diseases not usually associated and having little in common are presented together simply because they can be controlled to a greater or less extent by the given method. The reviewer does not feel that this is wise, though from the practical standpoint it may have some advantages. A striking example of what this plan leads to is found under the heading, "Public Health Legislation as a Method of Controlling Disease," in which we find Morphinism, Nicotinism, Alcoholism, and Automobile Accidents considered. This arrangement may be allowable for the ordinary college student and social worker who has no expectation of going into the medical profession, but for medical students and nurses, for whom the book is also designed, we believe the idea is wrong.

We doubt also the wisdom of going into treatment even as much as the author has done. This is again exemplified under automobile accidents: "Treatment. Those not killed but seriously injured are usually taken to the nearest hospital where they are given surgical attention." It is hard to see what place these two lines have in a book on hygiene—and being taken to a hospital is not treatment.

We like particularly the historical approach, which indeed we feel is too brief in some cases. We commend also the giving of the derivation of names from the Latin or Greek, as the case may be. This should relieve the student from a good deal of dry memorizing, as the derivations in most cases give a reason for the name, in spite of the fact that the ancient languages are not now a required part of the general education in most of our colleges and universities, as they were formerly.

The book is well written and one can detect the influence of the careful and logical mind which directed the writing. Anyone who was fortunate enough to know the author, as the reviewer did for many years, would expect this.

Some new words of which we cannot approve have been introduced, as "bacterination," meaning the use of dead

organisms to produce immunity, and "toxination," applied to the use of toxins for the same purpose.

While the history as far as given is generally correct, one mistake in dates is repeated several times. The discovery of the tubercle bacillus by Robert Koch, is given as 1881. Koch's preliminary and final papers announcing its discovery were both published in 1882 and this date has been accepted in all literature that we know of.

The printing and make-up are excellent, although there are some curious corrections in red pencil which should have been caught in the proof. On the whole, we like the book, in spite of questioning the wisdom of its arrangement. Perhaps the author has discovered something new and useful in the way of teaching.

MAZŸCK P. RAVENEL

Treatment in Psychiatry — *By Oskar Diethelm, M.D. New York: Macmillan,* 1936. 470 pp. Price, $4.00.

For many years psychiatry has been more or less considered "the weak sister in medicine," perhaps due, in some measure, to the fact that *treatment* in psychiatry has been largely neglected. Diethelm has more than retrieved the psychiatric profession from such accusing fingers in the presentation of *Treatment in Psychiatry,* which is easily the foremost text in its field.

The content and the point of view of this book to a very large extent take root in 10 years of association with Dr. Adolf Meyer, Psychiatrist-in-Chief of the Johns Hopkins Hospital. Students of Meyer as well as his admirers and those who have sought to gain a working knowledge of Meyerian principles are profoundly indebted to the author for such a clear and practical presentation of the province of dynamic psychiatry.

Instead of paying homage merely to disease entities, the book dedicates itself to the understanding of specific persons who are maladjusted because of varying degrees of personality dysfunction. First concern is with an understanding of the facts and factors entering into the problem of the person who is sick rather than with stereotyped, cut and dried symptomatologies which tend to give a pinkish tone of impersonality.

The treatment of major or sweeping personality deviations does not outweigh the attention given to the minor psychoses or psychoneuroses and particularly "the minor personality reactions of everyday life and with reactions to physical illnesses and handicaps." The various psychotherapeutic principles are expertly illustrated in well chosen case presentations. Each chapter is concluded with a bibliography which offers pertinent reading.

A wholesomely critical presentation of psychoanalytic theory, principles, and procedure is included. The limitations of psychoanalytic technic are stated as well as the constructive contribution and stimulus of Freudian psychoanalysis. Although an open mind toward the various schools of thought contributing to psychiatric understanding and practice is espoused, the author at no time loses sight of the need of turning to therapeutic advantage any helps which may further the welfare of the patient. The patient is our main concern; discussion of theory and dialectics herein contributes to "Psychiatrically trained common sense which allows the physician to see and create therapeutic opportunities and deal with them constructively."

This book marks a fundamental advance in psychiatric thinking and practice since it is the first time that Meyerian principles have been so comprehensively and clearly formulated

and illustrated. Every psychiatrist will utilize this book as his therapeutic bible. Herein the medical student as well as the general practitioner may find a mine of information which will clarify his understanding of the varying degrees of behavior and personality deviations from the norm to the sweeping involvements of gross personality disintegration. But it is the sound footing upon a critically seasoned experience which gives substance to optimism in the treatment of the mentally ill that calls forth gratitude for the author of this much needed publication. FREDERICK L. PATRY

A Text-book of Gymnastics (Form-giving exercises)—*By K. A. Knudsen, Translated by F. Braae Hansen. Philadelphia: Blakiston*, 1937. 364 pp. Price, $3.00.

This is a text on "Swedish" gymnastics, originated largely as a system for training Swedish army officers, later becoming medical and corrective in type and objectives, and finally being adapted to school use, especially—in that country—during the triple decade 1890–1920.

The author, Knudsen, late Chief Inspector of Physical Education to the Danish Board of Education, and the translator, Hansen, of State Training College, Haderslev, Denmark, and formerly of the College of Hygiene, Dumfermlin, Scotland, are among the leading authorities in the world on the type of physical education discussed in this text. It is an excellent contribution. Exercises are described clearly, their purpose and effect explained, and ample illustrations provided.

It has great value for the physical educator interested in corrective physical education and for the orthopedist. It has a worthy place in the libraries of teacher training colleges, of medical schools, and of public health departments, especially those responsible—as many now are—for programs for the care and treatment of crippled children.

CHARLES H. KEENE

Atlas of Hematology—*By Edwin E. Osgood, M.D., and Clarice M. Ashworth. San Francisco: J. W. Stacey, Inc.*, 1937. 255 pp. Price, $10.00.

The authors' intent to make this more than a reference book or guide to hematology has been well met. It represents research of practical, everyday application in laboratory medicine and in the practice of medicine and surgery.

The first nine chapters deal with grouped physical signs and symptoms, nomenclature, cell genesis and identification, and a minute description of the various blood cells, their characteristic features, and their associations and findings in disease. Chapters X to XVII inclusive reveal the application of the principles enounced in the preceding chapters to hematologic disease groups and special conditions.

The illustrations alone make this an outstanding book. They are in natural colors and from one type stain —Wright's—except for the special staining required for reticulocyte and peroxidase studies. Since Wright's blood stain is the one generally used in routine laboratory work, this is an added attraction and value. The illustrations portray blood cells in normal and abnormal morphology, in health and various disease complexes, where there are alterations in maturity of cells, types, numbers, etc. The blood pictures are especially grouped for the anemias, polycythemias, leukemias, hemorrhagic diseases, splenic, liver, and lymph node enlargements, sore throat and stomatitis, infections, allergy, and parasitism.

Of much value are the correlated symptoms, signs, and blood pictures of certain conditions and the timely sug-

gestions concerning therapy. The tables are very valuable, their contents well chosen and grouped for rapid and authentic use.

The Appendix is graced with extensive and rather comprehensive references to modern work in hematology, diagnostic and laboratory procedures employed in blood studies, blood findings in commoner parasitic diseases, and methodology.

The introduction of such an extensive revision of nomenclature of personal coinage and individual in type is questioned. The advantages to come from this are doubted. For years much confusion has existed through loose terminology and individual efforts to bring about modification. In this work where new terms are used the author is considerate enough to give always in parentheses the old term most nearly equivalent, and states that this is done "so that usage may decide which term is preferable for use in subsequent editions."

The material in the book is well presented, in good form, in a free, understandable style, and there is an excellent index. It is recommended to technicians, students in hematology, laboratory consultants, practitioners of medicine and surgery, and certain research workers. We know of no better work than this.

M. PINSON NEAL

Everyday First Aid—*By Walter Frank Cobb, M.D. New York: Appleton-Century,* 1937. 269 pp. Price, $1.50.

The book is composed of 25 chapters with foreword, postscript, appendix, and index. Its author is medical examiner, Department of Hygiene, College of the City of New York, and with the first aid service of the American Red Cross.

The discussion in each chapter is arranged in a practical and philosophical manner, the stage being set by a newspaper accident report. This is followed by analysis of the situation, first aid, subsequent history, and comment. Interestingly written with clever free-hand drawings depicting all sorts of mishaps and their immediate care, the book is primarily sound, informative, and intended for the average reader. In the chapter on "First Aid of Asphyxiation" one feels the victim, however, would have passed out long before artificial respiration was applied. We think it is said that 7 minutes without air exchange is the limit for resuscitation. The use of the word "carry" as a noun to describe the "four-hand" seat is probably professional rather than "dictionary."

By its arrangement the book is more a manual for him who would be prepared than for ready reference at the time of mishap, where the Red Cross manual would be much more serviceable, yet it stresses the great importance and methods of first aid in accidental mishaps as well as illness, poisonings, sunstroke, etc. The appendix lists the equipment which should be at hand in the home, the automobile, and for personal use.

EMERY R. HAYHURST

Learning to be Good Parents: Talks to Fathers and Mothers—*By Eleanor Saltzman. Boston: Manthorne and Burack,* 1937. 55 pp. $.25.

This booklet is composed of a number of simple talks to mothers and fathers. The subjects are those of everyday experience in rearing children and in answering their perplexing questions. The talks are presented largely in words of one syllable and in direct, didactic form. They evidently have been prepared for parents of limited education and experience.

In the chapter on growth it is questionable whether parents should be told "Jackie's heart is young and strong,

and he can work hard when he gets to be 14 or 15 . . . Perhaps Jackie's father is a farmer. Let 14 year old Jackie work in the field." The statement that "Liver is cheap and is good food" is certainly true following the conjunction; but it is not always "cheap." The talk on where babies come from is unusually frank. There is very little left to the imagination.

On the whole, this series of talks is based upon modern child study and psychology and is a wholesome attempt to get before parents of average intelligence the important facts.

RICHARD A. BOLT

Children Handicapped by Cerebral Palsy—*By Elizabeth Evans Lord, Ph.D. New York: Commonwealth Fund,* 1937. 105 pp. Price, $1.25.

So long as birth injuries play an important rôle in early infant mortality and in permanent crippling, studies such as this one will prove of value in the diagnosis, prognosis, training, and management of cases of cerebral palsy.

Dr. Bronson Crothers, in his short but comprehensive introductory chapter on *Medical Explanation,* states that "Accidents during labor are, in our opinion, the most important single cause of disability." He believes that few medical men are equipped by training and experience to appraise psychological factors; hence the importance of a guide such as the present one.

Dr. Lord has given us an exceedingly helpful volume including psychological aspects of muscle training, the mental testing program, mental development in relation to educational plans, the teacher's problem, and emotional problems of child and parent. A short, working bibliography appears at the end.

The book is written in an easy, understandable style which should prove interesting to intelligent parents, teachers, and nurses as well as to physicians and physiotherapists. It is practical throughout. The Commonwealth Fund is to be commended for publishing studies of this nature.

RICHARD A. BOLT

Proceedings of the Second National Conference on College Hygiene—*Sponsored by the Presidents' Committee of Fifty on College Hygiene, The National Health Council, and the American Student Health Association. New York: National Tuberculosis Association,* 1937.

This second report is a worthy successor to the first.[1] The introduction particularly shows the need of such conferences, as in 1936 only one-third of the colleges and universities in the country had required courses in hygiene. Many student health services also certainly need direction, organization, and expansion.

The conference has given us reports of a series of studies on hygiene in educational institutions discussing the institutional responsibilities in relation to student health. The report on Student Health Service is practical but sets high standards; that on Health Teaching is sound and practical.

Of special moment is the attention given to mental hygiene. This is generally regarded as an abstruse specialty and it is unfortunately true that the average practitioner does not know much about it, while many of those in charge of student health in our universities have not had the training in the subject which is so desirable. Another striking feature of this report is the attention given to tuberculosis. During the past few years a number of reports on tuberculosis among students in our colleges, universities, and medical schools have been published showing that students should be protected during this formative period.

1. Reviewed in the *A.J.P.H.*, Mar., 1932, page 341.

Tuberculosis in Negro colleges is well considered. In general urban populations the morbidity and mortality among Negroes is three times that if whites but it is said that the incidence of the disease is more nearly equal in college groups.

It is somewhat difficult to review this most interesting and useful publication since the reports it contains are concise. The make-up of the book is good, especially as to headings and subheadings. We commend it heartily to all those interested in the tremendous problems of student health.

MAZŸCK P. RAVENEL

The Psychology of Abnormal People—*By John J. B. Morgan, Ph.D. (2nd ed.) New York: Longmans-Green,* 1936. 605 pp. Price, $3.25.

This well known text again greets the eye of the teacher and student in the form of a second edition which brings the content up to date in the light of the increasing amount of scientific research.

The aim of the book is to interest the student in the scientific aspects of the subject maintaining an eclectic point of view with respect to the various creeds, schools, and cults. These are seen to be less and less subscribed to and complete with the advance in experimental psychology.

Professor Morgan states that the main purpose of the book is, "to aid the readers in understanding the more common weaknesses of human nature to the end that character and personality deformities may be avoided."

The volume is intended primarily for the student of abnormal psychology but may also be read with profit by public men, lawyers, social workers, and parents. In order to give a foundation for the more abnormal aspects of the psychological presentation, considerable space is apportioned to normal psychology.

The first chapter is devoted to the Science and Causes of Mental Disorders. The concept of the abnormal is discussed with commendable insight. Abnormal psychology for the author concerns itself with all degrees of abnormal behavior and personality deviations as well as the full-blown mental disorders. These latter are categorically classified.

The cause-effect understanding of various types of maladjustments in the light of reactions to internal and external stimuli and stress are formulated in a constructive manner. Of special import is the attention given to methods of prevention in the school as a feature for mental hygiene research and practice.

Succeeding chapters are devoted to disorders of sensation, perception and association, delusions, abnormalities of memory, emotional disorders, motor disorders, abnormalities of intelligence, personality, sleep and dreams, suggestion and hypnosis, benign mental disorders, disorders of regression, compensatory and episodic disorders. The final chapter is given over to treatment and prevention.

To each chapter is appended a glossary, projects for further study and well chosen references. This book, although primarily designed to subserve the academic interest of the student of psychology, can well be read by the medical student, and particularly the psychiatrist and all those interested in the broad aspects of mental hygiene. The educator in particular will find a multitude of significant passages which may be turned to good advantage in understanding teacher-child and parent-child relationships.

The training of teachers in mental hygiene and the need of clinical service in the form of child guidance clinics and well trained counselling personnel is emphasized.

The author is to be congratulated in

bringing to a more clarified formulation a second edition of this book which is easily a leader in its field.

FREDERICK L. PATRY

Physiological Hygiene—*By Cleveland P. Hickman. New York: Prentice-Hall,* 1937. 493 pp. Price, $3.25.

This book, designed to be used at the college level, tries to strike a happy medium between the too simple text which fails to arouse interest because it does not stimulate thought, and the too technical which discourages.

While it devotes more space to physiological processes than is usual in books of this aim, it is interestingly written and has large sections (*e.g.,* one on reproduction) that give attention almost wholly to the sociologic and hygienic phases of organic activity. Pages 239 to 454 are devoted wholly to hygiene and public health.

A bibliography, either by topics or at the end of chapters, would be a definite help as an aid to the development of special discussions, or for the study of definite personal or community health problems.

CHARLES H. KEENE

BOOKS RECEIVED

SOCIALIZED MEDICINE IN THE SOVIET UNION. By Henry E. Sigerist, M.D. New York: Norton, 1937. 378 pp. Price, $3.50.

SANITARY INSPECTOR'S HANDBOOK. By Henry H. Clay. 3rd ed. London: H. K. Lewis & Co., Ltd., 1937. 480 pp. Price, $5.00.

TWENTY-FIVE YEARS OF HEALTH PROGRESS. By Louis I. Dublin, Ph.D., and Alfred J. Lotka, D.Sc. New York: Metropolitan Life Insurance Co., 1937. 611 pp. Limited edition for distribution to selected list of libraries and specialists.

INTEGRATION: ITS MEANING AND APPLICATION. By L. Thomas Hopkins. New York: Appleton-Century, 1937. 315 pp. Price, $2.00.

APPENDICITIS—A CLINICAL STUDY. By W. H. Bowen, F.R.C.S. New York: Macmillan, 1937. 202 pp. Price, $2.50.

BABY'S FIRST TWO YEARS. By Richard M. Smith, M.D., Sc.D. rev. ed. Boston: Houghton, Mifflin, 1937. 122 pp. Price, $1.75.

PHENOMENON OF LOCAL TISSUE AND ITS IMMUNOLOGICAL, PATHOLOGICAL, AND CLINICAL SIGNIFICANCE. By Gregory Shwartzman, M.D. New York: Harper, 1937. 461 pp. Price, $7.50.

SAFE LIVING. By C. W. Hippler and Helen Burr Durfee. New York: Sanborn, 1937. 188 pp. Price, $.80.

A PEDIATRICIAN IN SEARCH OF MENTAL HYGIENE. By Bronson Crothers, M.D. Commonwealth Fund, 1937. 271 pp. Price, $2.00.

HEALTH AWARENESS TEST. By Mayhew Derryberry, Raymond Franzen, and William A. McCall. New York: Teachers College, Columbia University. Price, $3.20 per 100; $28.80 per 1,000; Specimen set $.15.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Some Conclusions about Influenza—Epidemic influenza is caused by a virus transmissible to ferrets and mice; progress in knowledge depends upon distinguishing the disease from other respiratory infections with which it is confused; there are grounds for hope that a prophylactic measure may be produced.

ANDREWES, C. H. Influenza; Four Years' Progress. *Brit. M. J. Sept. 11, 1937, p. 4001.*

Aiding the Grim Reaper—Mortality rates of persons with chronic diseases were studied with a view to determining proper insurance premium rates for sub-standard risks (due to medical impairments). Persons who had cancer with operation, syphilis, pleurisy, tuberculosis, among other conditions, had an excess of deaths from 2 to 4 times the expected rates. Syphilis led to an excess of deaths from organic heart disease, nephritis, and cancer. Public health problems are discussed.

BRITTEN, R. H. Risk of Mortality among Persons with Chronic Disease. Milbank Quart. 15, 4:303 (Oct.), 1937.

Tuberculosis Case Finding—In the Mulberry Health District in New York where 80 per cent of the quarters had no central heating plant, 77 per cent had no bath tub, 54 per cent had no hot water, and 48 per cent had no private indoor toilets, a special tuberculosis cast finding program was undertaken covering the families of all new and old cases, the testing of school children, and certain other groups. The value of examining relatives of cases is established, school child tuberculin testing in such an area is questioned, and more study is needed in examining recovered cases of respiratory disease. An excellent report.

DOWNES, J., and PRICE, C. R. Tuberculosis Control in the Mulberry District of New York City. Milbank Quart. 15, 4:319 (Oct.), 1937.

About the Fifth Cause of Death—An excellent summary of the present pneumonia situation. The history is reviewed, modern treatment measures are discussed, and the statistics are given from which it is estimated that 35,500 wholly unnecessary deaths occur from pneumonia each year in the United States. The use of rabbit serum rather than horse serum is discussed.

HORSFALL, F. L. The Control of Lobar PNEUMONIA. Canad. Pub. Health J. 28, 10:476 (Oct.), 1937.

Water-borne Infections—At the close of a panel discussion on gastroenteritis and the water supplies, the following conclusions seemed to be justified: gastroenteritis epidemics may be due to milk, food, and water; water-borne epidemics may be due to bacteria accompanied by organisms of the coli-aerogenes group. It was suggested but not proved that other bacteria not disclosed by standard methods may be the culprits, as might be non-living toxic substances. More study is needed.

LAUTER, C. J., *et al.* How Are Public Water Supplies Related to the Incidence of Gastroenteritis? J. Am. W. W. Assn. 29, 8:1137 (Aug.), 1937.

Health Officers and Mental Health—Advocating preventive mental centers as a part of all public health programs, the author reviews the ups and downs of the agencies designed to promote mental health. Mental hygiene should penetrate all public health work, he says.

LIBER, B. Practical Aspects of Public Mental Hygiene. New York State J. Med. 37, 18:1603 (Sept. 15), 1937.

Shellfish Conditioning—Reporting upon the successful demonstration plant for purifying oysters in tanks, the authors conclude that the plan is commercially feasible.

MESSER, R., and REECE, G. M. Progress in Oyster Conditioning. Pub. Health Rep. 52, 42:1451 (Oct. 15), 1937.

School Health—Suggesting, among many other things, that the N.E.A. undertake a systematic study of health education in the schools to formulate recommendations for the guidance of state programs. Public health problems are discussed for the benefit of school health and physical educators.

MILLER, E. K. Public Health Service and the School Health Program. J. Health & Phys. Ed. 8, 8:455 (Oct.), 1937.

Where Rural Health Funds Come from—Health administrative expenditures in 94 selected rural counties, totaling nearly 30 millions, was at the rate of about 86 cents per capita, made up as follows: through the health department 52 cents; other government agencies 11 cents; nonofficial, the remaining 23 cents.

MOUNTIN, J. W. How Expenditures for Selected Health Services Are Apportioned. Pub. Health Rep. 52, 40:1384 (Oct. 1), 1937.

Testing for Vitamin A Deficiency—Concluding that the biophotometer test does not appear to be an accurate method of detecting mild degrees of vitamin A deficiency in the routine survey of school children, this painstaking research will trouble those who have accepted the enthusiastic earlier reports of this visual method of determining vitamin deficiency.

PALMER, C. E., and BLUMBERG, H. The Use of a Dark Adaptation Technique (Biophotometer) in the Measurement of Vitamin A Deficiency in Children. Pub. Health Rep. 52, 41:1403 (Oct. 8), 1937.

Protecting against Polio—Dissertation on the difficulties of covering the olfactory area in the prophylactic spraying of noses against poliomyelitis infection. Ordinary spraying is ineffectual, says this writer.

PENTECOST, R. S. Zinc Sulphate as a Chemo-prophylactic Agent in Epidemic Poliomyelitis. Canad. Pub. Health J. 28, 10:493 (Oct.), 1937.

Whooping Cough Prophylaxis—Children in a tuberculosis hospital who were immunized against whooping cough with Sauer's vaccine developed the disease almost as frequently as the unimmunized children. The symptoms were milder than in the control group.

SIEGEL, M., and GOLDBERGER, E. W. Active Immunization of Tuberculous Children Against Whooping Cough with Sauer's Vaccine. J.A.M.A. 109, 14:1088 (Oct. 2), 1937.

Gonorrhea—A million have it.

VONDERLEHR, R. A., and USILTON, L. J. The Gonorrhea Problem in the United States J.A.M.A. 109, 18:1425 (Oct. 30), 1937.

ASSOCIATION NEWS

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Frank J. Condon, M.D., Court House, Centerville, Ia., Medical Director Health District 2, State Dept. of Health

C. N. Harris, M.D., Adams Hospital, Hibbing, Minn., Health Director and Co-Chairman of Community Health Committee, Board of Health

Harold R. Hennessy, M.D., Vista, Calif., Medical Officer assigned to CCC Medical Corps

W. J. Willsey, 8 Doering Way, Cranford, N. J., Health Officer

Daniel L. Seckinger, M.D., Dr.P.H., District Bldg., Washington, D. C., Assistant District Health Officer

Cecil A. Z. Sharp, M.D., 621 S. Forest Ave., Ann Arbor, Mich., District Public Health Superintendent, State Dept. of Public Health

Hilla Sheriff, M.D., Spartanburg, S. C., Director, Spartanburg County Health Dept.

Laboratory Section

Eleanor Alexander-Jackson, Ph.D., 44 Morningside Drive, New York, N. Y., Research Bacteriologist, State Dept. of Health

Mildred R. Cate, City Hall, Lynn, Mass., Laboratory Technician, Dept. of Public Health

Paul A. Moody, Ph.D., 197 Howard St., Burlington, Vt., Associate Professor of Zoölogy, University of Vermont

Vital Statistics Section

Mary A. Cleckner, 811 Green, Harrisburg, Pa., Supervisor of Tabulations, Bureau of Vital Statistics, State Dept. of Health

Harry H. Goode, 1860 Morris Ave., Bronx, N. Y., Assistant to Deputy Commissioner, Dept. of Health

Thomas J. Goodfellow, M.D., 20 Arcade Bldg., Saratoga Springs, N. Y., Member of Saratoga County Tuberculosis and Public Health Committee

Joseph Zubin, Ph.D., 50 W. 50 St., New York, N. Y., Psychologist-Statistician, Mental Hospital Survey Committee

Public Health Engineering Section

Harold Romer, 3115 Brighton 6th St., Brooklyn, N. Y., Health Inspector, Dept. of Health

Ramon A. Saavedra, Seccion de Higiene, Panama, Panama, Chief, Section of Sanitary Engineering, National Government.

Karl O. Schafer, 920 E. Catherine St., Ann Arbor, Mich., Sanitary Inspector, Indiana State Board of Health

Industrial Hygiene Section

John E. P. Hellstrom, 215 Central Ave., Louisville, Ky., Vice-President, American Air Filter Co.

William G. Terwilliger, M.D., 7 Hanover Square, New York, N. Y., Medical Director, W. R. Grace & Co.

McIver Woody, M.D., 26 Broadway, New York, N. Y., Standard Oil Company of New Jersey

Food and Nutrition Section

Lester O. Krohn, 1231–55 St., Brooklyn, N. Y., Veterinarian, Dept. of Health

Frank A. Tobin, 225 E. 202 St., New York, N. Y., Inspector of Foods, Dept. of Health

Public Health Education Section

Fred A. Forney, M.D., 341 State Capitol Bldg., Denver, Colo., Director of Tuberculosis Division, State Dept. of Public Welfare

Florence J. Hosafros, Galva, Illinois

Phyllis B. Koehler, 2 W. 43 St., New York, N. Y., Health Education Officer of Irvington House

Robert L. MacCormack, M.D., MacCormack Clinic, Whitehall, Wis., Member, State Board of Health

Iomergene Rowland, 1027 E. Catherine, Ann Arbor, Mich., School Health Educational Work

David A. Van der Slice, M.D., 426 Packard, Ann Arbor, Mich., School Physician

Public Health Nursing Section

Leona R. Adam, R.N., 101 W. Fourth St., Huntingburg, Ind., District Nursing Supervisor, State Board of Health

Marjorie L. Adams, 30 Albemarle St., Springfield, Mass., Consultant in Public Health Nursing, Division of Child Hygiene, State Dept. of Public Health

Dolly I. Bigler, R.N., 1136 Central Ave., Beloit, Wis., Graduate Student

Melida de Roberts, Box 1086, Panama, Panama, Supervisor and Instructor in Public Health Nursing, National Dept. of Health

Edith G. Dykstra, 1143 Haeberle Ave., Niagara Falls, N. Y., Child Welfare Nurse, Bureau of Health

Dorothy Johnston, 205 N. Thayer St., Ann Arbor, Mich., Student

Gertrude P. Lorber, 386 Ledgeview Ave., Fond du Lac, Wis., District Public Health Nurse, State Board of Health

Mary McCormick, R.N., 159 E. Main, Gouverneur, N. Y., District Supervising Nurse, State Dept. of Health

Ethel E. Mull, R.N., 576 Hollister Bldg., Lansing, Mich., Director, Greater Lansing V.N.A.

Gertrude R. Prichett, Hotel Greensbury, Glens Falls, N. Y., District State Supervising Nurse, State Dept. of Health

Eusebia I. Rodriguez, Box 516, Ancon, Panama, Instructor in Public Health Nursing, National Dept. of Health

Lucy Royster, 1309 Washtenaw Ave., Ann Arbor, Mich., District Nurse, Dept. of Health, Durham, N. C.

Mary B. Slattery, 2 Jackson Ave., Middletown, N. Y., District Supervising Nurse, State Dept. of Health

Epidemiology Section

Arthur W. Newitt, M.D., State Dept. of Health, Lansing, Mich., Director, Division of Tuberculosis

Unaffiliated

James M. Dunning, D.D.S., 1 Madison Ave., New York, N. Y., Dental Director, Metropolitan Life Insurance Co.

Charles K. Kincaid, M.D., 218 Elsby Bldg., New Albany, Indiana

Julio Ortiz-Perez, M.D., 3a #274, Vedado, Habana, Cuba

Samuel G. Paulo, 356 Ferry, Malden, Mass., Practising Physician

Robert M. Perlman, 1215 S. University, Ann Arbor, Mich., Student

Jerome S. Peterson, M.D., 380 Monroe St., Brooklyn, N. Y., Assistant Clinic Physician, Tuberculosis Bureau, Dept. of Health

Rolla J. Shale, M.D., 3336 Kildare Rd., Cleveland Heights, O., Student

Miriam R. Sherwood, 26 E. 81 St., New York, N. Y., Student

DECEASED MEMBERS

Elmer G. Balsam, M.D., Billings, Mont., Elected Member 1935

Bradford Massey, M.D., Pocomoke City, Md., Elected Member 1930

Arthur O. Peters, M.D., Dayton, O., Elected Member 1936

Belle M. Wagner, Chattanooga, Tenn., Elected Member 1926

A MESSAGE TO MEMBERS OF THE A.P.H.A.

AT the New York City Annual Meeting, on the recommendation of the Committee on Fellowship and Membership, the Governing Council voted to amend the By-laws so as to permit members of the Association to sponsor membership applications. Heretofore only the signatures of A.P.H.A. Fellows were accepted as sponsors of new members.

Why not exercise your prerogative and sponsor a coworker's application? Blanks will be forwarded on request from the Association office.

ORAL HEALTH GROUP

THE growing interest and increasing participation of dentists in public health work were signalized by the formation of an Oral Health Group at the recent Annual Meeting of the Association. A luncheon meeting, attended by 50 members and interested local dentists and dental health workers, provided an opportunity for an exchange of views.

It was agreed that it was desirable and would probably be mutually helpful if the dental activities of the Association were to have a common focal point in a dental group, with extension of these activities into various appropriate existing sections. It was therefore decided that the dental members be urged to join the sections in which they felt a special interest and carry to those sections the dental viewpoint on problems under discussion. It was decided to postpone for the present, at least, application to the Association for the creation of a dental section.

It was brought out in the discussion that an Oral Health Group might attract to itself not only dentists and dental hygienists, but research workers, nutritionists, public health nurses, and others interested in dental problems. Among the functions of such a group, in addition to those already noted, it was felt that the following would be helpful to the Association and in public health work:

Evaluation of papers and exhibits on dental topics offered to the Association for its programs.

Offer suggestions as to types of dental public health programs in different types of communities.

Carry on appropriate interest in the appointment of dentists to state and local boards of health.

It was decided to hold a meeting at the time of the Annual Meeting of the American Public Health Association, but not conflicting with the sessions of the Association. The temporary officers, Drs. John Oppie McCall, New York, *Chairman,* and Harry Strusser, New York, *Secretary,* were elected until the next Annual Meeting.

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge. Public health nurses are registered with the Joint Vocational Service, 122 E. 22 Street, New York, N. Y., with which the Association coöperates.

Replies to these advertisements, indicating clearly the key number on the envelope, should be addressed to the American Public Health Association, 50 W. 50 Street, New York, N. Y.

POSITIONS AVAILABLE

The U. S. Civil Service Commission announces an unassembled examination for medical graduates trained and experienced in maternal and child health. Salaries $3,200 to $5,600. Applications close December 28. Circular 96 may be obtained from Commission in Washington or any first class post office.

WANTED—(a) Obstetrician for special demonstrations; public health appointment; South. (b) Public health physician; rural district, southern state; preferably under 35; will provide for special training; $3,600-$4,800. (c) County nurse; duties are largely public health, confined to tuberculosis work; $150, car expenses; midwest. (d) Public

health nurse with knowledge of medical social work required; duties include assistance in direction of clinical experience of student nurses; degree required; $1,900, meals, laundry. (e) Medical social worker for one of New Jersey's leading hospitals; must be thoroughly experienced. (f) Graduate nurse qualified in physiotherapy; must be experienced and capable giving necessary muscle training after care of infantile paralysis patients; $125. #27-PH, Medical Bureau (M. Burneice Larson, Director), Pittsfield Building, Chicago.

POSITIONS WANTED

WANTED—Public health appointments for the following: (a) Well-qualified physician; A.B., M.D. degrees, leading schools; several years' successful practice during which time he held part-time public health position; recently completed graduate training in public health medicine and hygiene. (b) Graduate nurse; B.S. in public health nursing; graduate courses in public health nursing, Western Reserve and Columbia; several years' executive experience in public health work. . . . Upon request from employing officials of public health organizations, further information will be submitted. Medical Bureau (M. Burneice Larson, Director), Top Floor, Pittsfield Building, Chicago.

HEALTH OFFICERS

Physician, M.D., Western Reserve; short course for Health Officers, Johns Hopkins; with county and state experience, wishes administrative or epidemiological position; North or West preferred. A349

Physician, M.D., Yale, completing M.P.H. at Columbia; good clinical background; will consider appointment in child health, epidemiology or public health administration. A350

Physician, M.D., Northwestern University; Dr.P.H., Yale; will consider appointment in general administration, infant welfare or epidemiology. A300

Physician, M.D., University of Georgia; M.P.H., Harvard; experienced in city health administration, will consider an attractive opening in administrative or epidemiological work in South or West. A206

Experienced Health Officer who has completed Vanderbilt short course, 1936, will consider appointment. West preferred. A320

Physician, age 30; graduate of Indiana University; C.P.H., Johns Hopkins; available for full-time county health work or epidemiology. A340

Physician, graduate of Columbia P. & S., with teaching and administrative experience in pediatrics, will consider administrative position in child hygiene. A341

Physician, age 33; M.D., University of Wisconsin; M.P.H., Harvard; specializing in industrial hygiene, will also consider general administration. A342

Physician, M.D., Ohio State University; C.P.H., Harvard; with special interest in industrial hygiene, will consider position as epidemiologist and health officer. A345

Physician, M.D., University of Maryland; C.P.H., Johns Hopkins; broad experience in county public health administration, will consider opening of better class. A346

CHILD HYGIENE

Woman physician, M.D., Rush Medical; wishes administrative or clinical position in maternal and child health. C347

Woman physician, M.D., Yale; Dr.P.H., Yale; experienced in pediatrics and administration of state bureau, will consider attractive opening. C348

STATISTICIAN

Young man with 8 years' experience in public health statistics in well known national organization, and degree in Business Administration, now employed, will consider statistical position or combination with office administration. A310

MISCELLANEOUS

Dentist, graduate of Temple University, with excellent postgraduate experience, desires position in administrative aspects of dental hygiene. M352

Bacteriologist with training at C.C.N.Y., N.Y.U. and Cornell Medical College, wishes laboratory position in bacteriology; East or Southwest. M351

Woman with excellent preparation and wide experience in health education field; organization, administration, supervision and program-making in city, rural and state work. Now employed but would consider good opportunity. $3,500 minimum. M316

Experienced teacher, B.S., Massachusetts Institute of Technology, graduate courses Harvard School of Public Health, wishes teaching position or will consider statistical or health education opportunity. M353

NEWS FROM THE FIELD

LEAGUE ISSUES REPORT ON NUTRITION

THE League of Nations Mixed Committee on the Problem of Nutrition appointed in September, 1935, has issued a detailed report. It urges governments to adopt a conscious nutrition policy by establishing national committees to ascertain food consumption habits and nutritional status in all sections of the population. Detailed evidence of malnutrition even in the most advanced countries is given in the report, which is intended to be used as a basis for a world nutrition policy during the next few years.

The committee is made up of representatives of the Technical Commission of the Health Committee of the League, the International Labor Office and the International Institute of Agriculture. The United States was represented by Professor E. V. McCollum,* of Baltimore, Md.; Dr. Edwin G. Nourse and Dr. Harold B. Rowe, of the Brookings Institution, Washington, D. C.; Dr. Faith M. Williams, of the Department of Labor, Washington, D. C.; and Professor Warren C. Waite, of Minneapolis.

UNIVERSITY OF CALIFORNIA DEPARTMENT OF PUBLIC HEALTH NURSING

A NEW department of public health nursing has been announced at the University of California at Los Angeles, with Eleanor L. Beebe in charge as Assistant Professor of Public Health Nursing.

SAN FRANCISCO HEALTH EXHIBIT

THE prevention of disease will be the theme of the Health Exhibit planned for the Golden Gate International Exposition in San Francisco in 1939.

A committee composed of representatives of medical and allied agencies in California has been appointed to work out the details of the Health Exhibit with Milton Silverman, head of the Health and Science Division.

BALTIMORE OPENS THIRD HEALTH DISTRICT

THE Baltimore Health Department opened the Southeastern Health District August 16. This is the third of the eight health districts into which the city is being divided. The new unit includes all the first, second, and third wards and that portion of the twenty-sixth ward south of Federal Street with a population of about 100,000 persons; headquarters are established at 901 South Kenwood Avenue.

William H. F. Warthen, M.D.,* Assistant Commissioner of Health, will have direct charge for six months and will be assisted by John A. Skladowsky, M.D., the full-time District Health Officer.

TEXAS PUBLIC HEALTH ASSOCIATION ELECTS NEW OFFICERS

AT its 15th annual meeting, held November 1–3 in Dallas, the Texas Public Health Association elected the following officers for 1938:

President—Benjamin M. Primer, M.P.H., M.D.,† Amarillo

1st Vice-President—Austin E. Hill, M.D., C.P.H.,† Tyler

2nd Vice-President—Frances Gayle, San Antonio

3rd Vice-President—Mervyn B. Starnes, D.V.M.,† Dallas

Secretary-Treasurer—P. A. Kerby, Austin

* Fellow A.P.H.A.
† Member A.P.H.A.

INTERNATIONAL SOCIETY OF MEDICAL HEALTH OFFICERS

NEW officers of the International Society of Medical Health Officers are announced as follows:

President—Eugene L. Bishop, M.D., C.P.H.,* Chattanooga, Tenn..

Vice-President — Francis E. Harrington, M.D.,† Minneapolis, Minn.

Secretary-Treasurer—Leon Banov, M.D.,* Charleston, S. C.

The International Society of Medical Health Officers is planning to cooperate with the Health Officers Section of the American Public Health Association in the development of a one-day Health Officer's Forum of practical administrative problems immediately preceding the 1938 convention of the Association, October 25–28, 1938, in Kansas City, Mo.

NEW YORK WORLD'S FAIR MEDICAL DIRECTOR

THE appointment of Dr. Joseph Peter Hoguet, of New York, N. Y., as Administrative Assistant and Medical Director of the New York World's Fair of 1939 was announced by Grover A. Whalen, President of the Fair.

In this position Dr. Hoguet will be in charge of the executive and administrative work of the Division of Public Health, Medicine, and Sanitation. He will also be responsible for the health of members of the exposition staff and other employees and of visitors attending the Fair when the latter is opened to the public.

AMERICAN RED CROSS

A SURVEY of the nursing services of the American Red Cross now is under way at direction of Admiral Cary T. Grayson, Chairman, who is seeking recommendations for the future of the services in broader helpfulness to the public.

This review is being made by Alta E. Dines,* Director of Nursing of the New York Association for Improving the Condition of the Poor, whose services have been loaned by that agency to the Red Cross for the purpose. Miss Dines is making her headquarters temporarily at the Red Cross in Washington.

WEST VIRGINIA PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

NEW officers elected at the meeting of the West Virginia Public Health Association, November 10, are as follows:

President — Reece M. Pedicord, M.D.,† Wheeling

Vice-President—Charles E. Watkins, M.D.,† Fayetteville

2nd Vice-President—W. W. Hume, M.D.,† Beckley

Secretary-Treasurer — Thomas W. Nale, M.D.,† Charleston

NATIONAL SOCIAL HYGIENE DAY

THE second National Social Hygiene Day will be held February 2, 1938. The decision to center attention upon social hygiene activities in February grew out of a series of annual regional conferences and an increasing demand for general participation in early planning for the year's work. The first national observance of this day was so successful and was followed by such favorable comment from all parts of the country that the American Social Hygiene Association was urged to repeat and extend the program with coöperation of other national voluntary agencies. Some other date early in the year may be substituted in any given community to fit in best with other local meetings.

HOME OWNER'S LOAN CORPORATION ORGANIZES HEALTH SERVICE

EMPLOYEES of the HOLC have organized a comprehensive health service, financed by the Federal Home

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† Member A.P.H.A.

Loan Bank Board and by Edward Filene's Twentieth Century Fund. This experiment in group health service is chartered in the District of Columbia under the name of the Group Health Association, Inc. A clinic headed by Dr. H. R. Brown, of San Francisco, is staffed by 15 specialists. Full hospitalization, ambulance and nursing service are included in the plans of the association. Single employees of HOLC will pay $28.40 a year and married couples, $39.60 for these services.—*The Health Officer.*

COURSE FOR TUBERCULOSIS WORKERS

THE National Tuberculosis Association announces an Institute for the Training of Tuberculosis Workers, to be held under the auspices of New York University, at the office of the New York Tuberculosis and Health Association, 386 Fourth Avenue, New York, N. Y., from January 31 to February 12, 1938.

The registration fee is $10.00, payable at the University on or before the opening day.

NEW YORK HEALTH BOARD BANS LOOSE MILK

MILK sold by the glass in restaurants, soda fountains, and all other food dispensing places in New York City for consumption on the premises where sold, must either be dispensed in original containers or be drawn from sealed dispensing devices satisfactory to the Department of Health after January 1, according to a resolution adopted by the Board of Health. This means the death knell of the insanitary milk pump, the end of milk being poured out of quart bottles which frequently stand open, according to Dr. John L. Rice. It also means a reduction in the possibility of contamination through improper handling and so marks the advent of a cleaner and safer milk era in eating establishments.

Notice of the action of the Health Board was sent all restaurant associations in the city last August.

FEVER THERAPY

THE School of Medicine of the University of Pittsburgh announces the appropriation of $50,000 by the Westinghouse Electric & Manufacturing Company to launch and support a 3 year program of research in fever therapy.

The Westinghouse contribution was made to aid research which may have widespread beneficial effects on the health of persons employed in industry as well as the general public. By agreement between Westinghouse and the University of Pittsburgh, the results will be made available to all medical authorities for use in improving the public health.

UTAH'S NEW HEALTH ASSOCIATION

AT a meeting of public health workers held early in November in Salt Lake City, the Utah Public Health Association was formed and a Constitution and By-laws were adopted which limit active membership to members or Fellows of the American Public Health Association.

It is expected that this new Association will apply for affiliation with the American Public Health Association in the near future.

ANNUAL SCIENTIFIC EXHIBITION

THE Annual Science Exhibition, to be held December 27–30, 1937, in connection with the Indianapolis meeting of the American Association for the Advancement of Science, promises to be a distinctive attraction. The exhibition will be held in Murat Theatre, Indianapolis, Ind., along with registration and

* Fellow A.P.H.A.
† Member A.P.H.A.

general sessions. The different societies will be meeting only a few blocks away, except for the mathematical groups, which will be in session at Butler University.

F. C. Brown, Director of Exhibits, expresses the hope that all members of the association attending the Indianapolis meeting will arrange to spend as much time as possible at the exhibition. Furthermore, he would like to be advised of work that might be incorporated in the exhibition. Address F. C. Brown, Director of Exhibits, American Association for the Advancement of Science, Smithsonian Institute, Washington, D. C.

RICKETTSIAE OF SPOTTED FEVER AND TYPHUS CULTIVATED IN VITRO

DR. Ida A. Bengston, Ph.D.,† of the National Institute of Health, Washington, D. C., has recently cultivated, on artificial media, the rickettsiae of Rocky Mountain spotted fever in 15 passages, and of endemic typhus fever in 17 passages. Heretofore cultivation of the rickettsiae organisms has been possible only *in vivo,* either in animals or on living tissue cultures. The significance of this development is in the relative ease and economy of this method of keeping strains of expensive vaccine.—*The Health Officer.*

PERSONALS

Central States

DR. ALBERT C. BAXTER,† Assistant Director of the Illinois State Department of Health since 1930, has been appointed Acting Director.

KURT CARL BECKER, M.D.,† Director of the Royal Oak District Department of Health, Oakland County, Mich., has been appointed Commissioner of Health for the City of Troy and Miami County, Ohio, succeeding the late EDGAR R. HIATT, M.D.†

DR. BERNETA BLOCK, of Pyengyang, Korea, has been appointed field physician for the Bureau of Child Hygiene and Public Health Nursing of the Michigan State Department of Health, succeeding DR. PEARL A. TOIVONEN, resigned.

DR. MARLIN W. CARLSON, of Ellinwood, Kans., has been named Health Officer of Barton County.

DR. FRANK J. CONDON,† of Fort Dodge, Ia., has been appointed Director of District Health Service No. 2, which commenced operations on October 1 with headquarters in Centerville. The District comprises Clarke, Monroe, Decatur, Wayne, and Appanoose Counties.

DR. THOMAS E. EYRES † has been appointed Health Officer of the newly organized Polk County Health Unit, with headquarters in Des Moines, Ia. HARRY E. RANSOM, M.D.,† Health Commissioner of Des Moines, will coöperate with Dr. Eyres in public health matters affecting both city and county, though the new unit will not serve the city of Des Moines directly. The state will maintain the unit.

DR. HUGO A. FREUND, of Detroit, Mich., has been appointed a member of the Public Welfare Commission of Detroit.

DR. BENJAMIN E. JONES, of Davenport, Iowa, has retired as Supreme Medical Director of the Modern Woodmen of America, after 34 years in the office.

JOSEPH H. KINNAMAN, M.D.,† of Des Moines, Director of the Division of Child Health and Education of the Iowa State Department of Health, has been granted a year's leave of absence to take a course at the Johns Hopkins School of Hygiene and Public Health, Baltimore.

* Fellow A.P.H.A.
† Member A.P.H.A.

EDWIN H. PLACE, M.D.,† of Burlington, Ia., has been appointed Health Officer for Midland County, Mich., succeeding LESLIE V. BURKETT, M.D.,† of Midland, Mich., who has accepted a similar position in Genesee County, Mich.

DR. CHESTER L. PUTNAM, of Holstein, Ia., has been appointed Field Director for the organization of District Health Service No. 3, which is to comprise 8 counties.

DR. EMILY L. RIPKA has been appointed field physician for the Bureau of Child Hygiene and Public Health Nursing of the Michigan State Department of Health, succeeding DR. VIDA GORDON, who resigned to accept a position with the University of Michigan Health Service.

DR. ERWIN C. SAGE, formerly of Eagle Grove, Ia., has been appointed Medical Director of the Des Moines County Health Unit, succeeding EDWIN H. PLACE, M.D.,† resigned.

DR. ARTHUR W. THOMAS, of Ashtabula, Ohio, has been appointed Chief of the Bureau of Child Hygiene and Maternal Welfare, Ohio State Department of Health, to succeed ABRAM L. VAN HORN, M.D.,† who resigned recently.

DR. EMERY TREKELL, of Wellington, Kans., has been appointed Health Officer of Sumner County.

Eastern States

HAVEN EMERSON, M.D.,* Executive Officer, DeLamar Institute of Public Health, College of Physicians and Surgeons, Columbia University, New York, received an honorary doctor's degree at the recent celebration of the Hundredth Anniversary of the University of Athens, Greece.

JOSEPH P. GAREN, M.D.,† has been promoted in the New York State Department of Health to the position of District State Health Officer and is now stationed at the District Office at Saranac Lake, which includes the counties of Clinton, Essex, Franklin, and Hamilton.

CLIFFORD R. HERVEY, M.D.,* of Oswego, N. Y., retired recently from 20 years' service with the New York State Department of Health.

DR. PHOEBUS A. T. LEVINE, of New York, who has been with the Rockefeller Institute for Medical Research since 1905, has received the William H. Nichols Medal for 1938, the outstanding distinction in chemical science, for his work in the field of biochemistry. The Award was founded in 1902, to stimulate original research. In 1931 Dr. Levine was awarded the William Gibbs Medal of the Chicago Section of the American Chemical Society for his work in the application of organic chemistry to biological problems.

DR. EDWARD H. LINNEHAN, of Brooklyn, N. Y., has been appointed Director of the Medical Service of the United States Steamship Lines.

MARIAN G. RANDALL, R.N.,† a member of the technical staff of the Milbank Memorial Fund, New York, has accepted an appointment as Supervisor of Records and Studies on the staff of the Henry Street Visiting Nurse Service in New York City, beginning January 1, 1938.

LEOPOLD M. ROHR, M.D.,* District Health Officer in charge of the Red Hook-Gowanus Health District, New York City Department of Health, has been appointed Instructor in Clinical Preventive Medicine and Community Health at Long Island College of Medicine, Brooklyn, N. Y.

JOHN M. SCHIFF has been elected President of the Henry Street Settlement, New York, succeeding LILLIAN

* Fellow A.P.H.A.
† Member A.P.H.A.

D. WALD who founded the organization in 1893. Mr. Schiff has served as Vice-President for several years. Miss Wald assumes the title of President Emeritus. Mr. Schiff is Chairman of the Drive for $250,000 which the Visiting Nurse Service, administered by the Henry Street Settlement, is conducting at the present time; over $135,000 has been raised to date.

RICHARD SLEE, M.D.,† of White Plains, N. Y., First Deputy Health Commissioner of Westchester County since 1930, retired October 1.

DR. WILLIAM E. STEELE, of Olympia, Wash., has resigned as Chief Medical Adviser for the State Department of Labor and Industries, to enter private practice in Longview.

DR. WILLIAM J. TIFFANY, Superintendent of the Pilgrim State Hospital, Brentwood, N. Y., has been appointed State Commissioner of Mental Hygiene of New York, to succeed DR. FREDERICK W. PARSONS, who retired October 1.

Southern States

GEORGE MARVIN ANDERSON, M.D.,† of Atlanta, Ga., has been appointed Commissioner of Health of Calhoun County.

DR. HERBERT N. BARNETT, of New Orleans, La., has been appointed Acting Health Director of Bossier Parish, succeeding DR. MURPHY M. SIMS, of Benton, resigned.

DR. BENJAMIN S. BLACK, of Grove Hill, Ala., has been appointed Health Officer of the newly established Clarke County Health Unit.

DR. CLARENCE BURKE BREWSTER, of Fort Worth, Tex., has resigned as Health Officer of Tarrant County, to become School Physician for Fort Worth.

FRITZ A. BRINK, M.D.,* of Blackshear, Ga., has been appointed Director of the newly created Department of Health in Clinch County, with headquarters in Homerville.

WILLIAM D. BURKHALTER, M.D.,† formerly of Rockford, Ala., has resigned as Health Officer of Coosa County to become Assistant Director of the Division of Venereal Disease Control of the Bureau of Preventable Diseases, Alabama State Department of Health. He will be succeeded by DR. WILLIAM H. GOFF, of Glasgow.

R. FRANK CARY, M.D.,† of Dawson, Ga., Health Officer of Terrell County since January, 1936, has resigned.

DR. THOMAS W. COLLIER, formerly of Albany, Ga., has been appointed Health Commissioner of a joint health unit for Toombs and Montgomery Counties, with headquarters in Lyons.

C. B. CRITTENDEN, M.D.,* of Madison, Tenn., has been appointed Director of the Division of Maternal and Child Health in the Kentucky State Board of Health, with offices in Louisville.

DR. WILLIAM M. DICKENS, of Greenville, Tex., has been appointed to the Texas State Board of Health, to succeed the late DR. SAMUEL A. WOODWARD, of Fort Worth.

DR. J. N. DUDLEY † was appointed Health Officer of Northampton County, Va., effective July 1.

DR. MONROE D. EATON, JR., of the Department of Bacteriology and Immunology, Washington University School of Medicine, St. Louis, Mo., has been appointed to the staff of the International Health Division of the Rockefeller Foundation, New York.

CHARLES H. ELLER, M.D., DR.P.H.,* of Richmond, Md., Director of the Bureau of Rural Health, has been

* Fellow A.P.H.A.
† Member A.P.H.A.

appointed Health Officer of the Eastern Health District in Baltimore. He succeeds HARRY S. MUSTARD, M.D.,* who resigned to become the Hermann M. Biggs Professor of Preventive Medicine at New York University College of Medicine, New York.

DR. WILLIAM H. GOFF, formerly of Glasgow, Ky., has been given charge of the Coosa County Health Department, with headquarters in Rockford, Ala.

J. R. JENNINGS, B.S.,* until recently Chief of the Division of Milk Control of the Louisville, Ky., Board of Health, is now associated with the Diversey Corporation of Chicago, Ill.

DR. WILLIAM A. KRIEGER, of Newport, Ky., has been appointed City Health Officer, to succeed DR. JOHN TODD.

CHARLES L. SAVAGE, M.D.,† of Richlands, Va., has resigned as Health Officer of Tazewell, Buchanan, and Russell Counties.

DR. MURPHY M. SIMS, of Benton, La., has resigned as Health Director of Bossier Parish, to engage in private practice in Waskom, Tex. DR. HERBERT N. BARNETT, of New Orleans, has been appointed Acting Director.

DR. WILFRED N. SISK, Assistant Director of the Giles County, Tenn., Health Unit, has been appointed Health Officer, to succeed DR. JOSEPH C. TATUM, resigned.

DR. BROOKS STAFFORD, of Angleton, Tex., has been appointed Health Officer of Brazoria County, to succeed the late DR. SAMUEL B. MAXEY.

DR. ALVIN L. STEBBINS, of Punta Gorda, Fla., has been appointed Health Officer of Manatee County.

DR. JOSEPH C. TATUM, of Pulaski, Tenn., has resigned as Health Officer of Giles County.

DR. WILLIAM M. WEEMS, formerly of Clopton, Ala., has been appointed Health Officer of Palm Beach County, Fla.

DR. HENRY G. WELLS, of Richmond, Ky., has resigned as Health Officer of Madison County.

Western States

JAY D. DUNSHEE, M.D.,* until recently Director of Public Health of Idaho, has been appointed Director of Local Health Administration of Arizona, succeeding A. N. CRAIN, M.D.,* of Phoenix.

CECIL R. FARGHER, M.D., of Wenatchee, Wash.,† Health Officer of Chelan County, was elected President of the Washington State Public Health Association at its recent annual meeting in Tacoma. ROY M. HARRIS, C.E.,† of Seattle, was named Secretary.

DR. EMMETT E. SAPPINGTON † has been appointed temporarily as Assistant Director of Public Health of San Francisco, Calif., pending civil service commission examination.

Canada

DR. DOUGLAS H. FRYER, of Toronto, Ont., has been appointed Health Officer of Greene County, Ala.

Foreign

PROF. ALBERT SZENT-GYÖRGYI, Professor of Medical Chemistry, Szeged University, Szeged, Hungary, has been awarded the 1937 Nobel Prize for Physiology and Medicine, "as a reward for his discoveries on the biological process of combustion, especially in relation to vitamins A and C." Professor Szent-Györgyi has carried on his research in laboratories in Austria, Germany, England, and the United States. He spent some time at the Mayo Clinic, Rochester, Minn., and in Chicago,

* Fellow A.P.H.A.
† Member A.P.H.A.

and has lectured at Harvard University.

DEATHS

DR. FRANCIS W. O'CONNOR, Director of the Department of Tropical Diseases at Columbia University and Associate Professor of Medicine, died October 3, at the age of 53 years.

BRADFORD MASSEY, M.D.,† Deputy State Health Officer and Health Officer of Worcester County, of Pokomoke City, Md., died August 3. He was associated with the Maryland State Department of Health from 1929.

† Member A.P.H.A.

CONFERENCES AND DATES

American Academy of Orthopaedic Surgeons. First West Coast Meeting. Hotel Biltmore, Los Angeles, Calif. January 16–20, 1938.

American Association for the Advancement of Science, and Annual Science Exhibition. Murat Theater, Indianapolis, Ind. December 27–30.

American Association of Medical Social Workers, Seattle, Wash. June, 1938.

American Association of Pathologists and Bacteriologists. Atlantic City, N. J. May 3–4, 1938.

American College of Physicians,. Waldorf-Astoria Hotel, New York, N. Y. April 4–8, 1938.

American Institute of Nutrition. Baltimore, Md. Spring, 1938.

American Medical Association. San Francisco, Calif., June 13–17, 1938.

American Society of Heating & Ventilating Engineers, 44th Annual Meeting. Hotel Biltmore, New York. January 24–28, 1938.

American Statistical Association. (Several sessions on Vital Statistics and Biometrics.) Haddon Hall, Atlantic City, N. J. December 27–31.

American Veterinary Medical Association. New York, N. Y. July 5–9, 1938

American Water Works Association. New Orleans, La. April 24–28, 1938.

California Fruit Growers and Farmers Convention. San Jose, Calif. December 6–8.

Chemical Exposition — Sixteenth Annual. Grand Central Palace, New York, December 6–11.

Congress of American Physicians and Surgeons. Atlantic City, N. J. May 2–6, 1938.

Connecticut Public Health Association. Hotel Bond, Hartford, Conn. December 1.

Dairy Products Association of the Northwest. St. Paul, Minn. April, 1938.

Dental Meeting, Thirteenth Annual. Pennsylvania Hotel, New York, N. Y. December 6–10.

Fifth International Heating and Ventilating Exposition. Grand Central Palace, New York, N. Y. January 24–28, 1938.

Florida Public Health Association. Tallahassee, Fla. December 6–8.

Georgia Public Health Association. Atlanta, Ga. May, 1938.

Iowa Public Health Association. Des Moines, Ia. May, 1938.

Massachusetts Public Health Association. Boston, Mass. January 27, 1938.

Medical Library Association. Boston, Mass., June, 1938.

Mississippi Public Health Association. Second Annual Meeting. Jackson, Miss. December 9–10.

National Conference of Social Work. Seattle, Wash. June 26–July 2, 1938.

National Tuberculosis Association's In-

stitute for the Training of Tuberculosis Workers—to be held under the auspices of New York University. New York Tuberculosis and Health Association, 386 Fourth Avenue, New York. January 31–February 12, 1938.

National Warm Air Heating and Air Conditioning Association. New York, N. Y. January 24–26, 1938.

New Jersey Health and Sanitary Association—63rd Annual Meeting. Princeton, N. J. December 10–11.

New York State Health and Physical Education Association. Syracuse, N. Y., December 26–28, 1937.

Pan American Medical Association—Seventh Cruise Congress to Havana. (Pan American Medical Association, 745 Fifth Avenue, New York, N. Y.) January 15–31, 1938.

Ohio Federation of Public Health Officials. Columbus, Ohio. March or April, 1938.

Second National Conference on Educational Broadcasting. Chicago, Ill. November 29, 30, December 1.

Second National Social Hygiene Day. Theme, "Stamp Out Syphilis—Foe of Youth." February 2, 1938.

Social Work Publicity Council. Seattle, Wash. June 26–July 2, 1938.

Society of American Bacteriologists. Washington, D. C. December 28–30.

United Fresh Fruit and Vegetable Association. New Orleans, La. January 10–13, 1938.

Western Branch, American Public Health Association. Portland, Ore. May 30, 1938.

FOREIGN

International Organisation Against Trachoma (during meeting of the International Council on Ophthalmology). Cairo, Egypt. December 8–14.

World Conference on Leprosy. International Leprosy Association. Cairo, Egypt. March 21, 1938.

Hawaii Territorial Medical Association. Honolulu, T. H. May, 1938.

Scientific Congress of Doctors and Dentists—"ARPA." Prague. July 21–25, 1938.

British Dental Association. Belfast. July 29–August 3, 1938.

International Congress of Obstetrics and Gynecology. Amsterdam, The Netherlands. May 4–8, 1938.

International Meeting for Cell Research. Anatomical Institute, Zurich, Switzerland. August 7–13, 1938.

Sixteenth International Physiological Congress. Zurich, Switzerland. August 14–18, 1938. All members of physiologic, biochemical, experimental pathologic and pharmacologic institutes or laboratories are entitled to participate; others must be recommended.

ANNOUNCING

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Shadow on the Land: Syphilis—Thomas Parran, M.D.	2.50
Tuberculosis Education—Elma Rood	1.25
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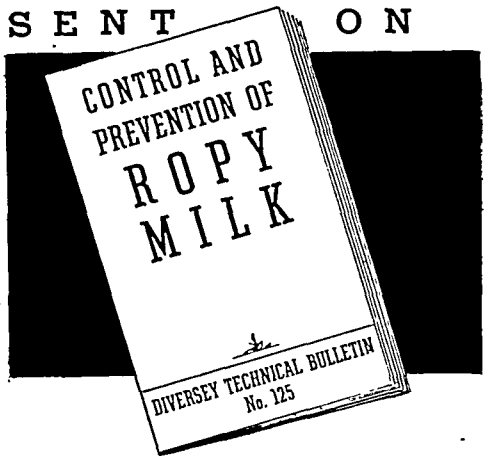
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High and Low Temperature Digestion Experiments. IV. Effect of Certain Toxic Wastes.

Effect of Stirring of Sludge on Vacuum Filtration.

Adjustment of pH Value of Sewage by Means of Carbon Dioxide.

Comparison of Sewages of Ohio Municipalities on Basis of Oxygen Requirement per Capita per Day.

Notes on Operation of the San Antonio Activated Sludge Plant.

Operating the El Paso Chemical Treatment Plant.

Activated Carbon—Its Place in Sewage Treatment.

Starting and Operating the Coatesville, Pennsylvania, Sewage Treatment Works.

Sewer Maintenance.

Marcy State Hospital Sewage Treatment Works.

New Tools for Plant Control.

These articles are typical of the contents published in each bimonthly issue of SEWAGE WORKS JOURNAL. If you are interested in being kept informed of the current research developments in sewage or waste-water treatment, write for complete information regarding subscription.

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By C. K. HIMMELSBACH, M.D.
Passed Assistant Surgeon U. S. Public Health Service

and

OTHILIA T. MERTES, R.N.
Head Nurse, U. S. Public Health Service

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By HELENA WILLIS RENDER, B.S., R.N.

Child Health in Other Lands

By SALLY LUCAS JEAN, R.N.

Dressing the Wounds of China

By ANABEL PARKER MCCANN

The Seeing Eye Meets the Needs of the Blind

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AMERICAN JOURNAL OF PUBLIC HEALTH

and

THE NATION'S HEALTH

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AMERICAN PUBLIC HEALTH ASSOCIATION

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1a 1934 J. Amer. Med. Assn. 102, 892.
b. 1936 Ibid. 106, 996.
c. 1937. Ibid 108, 7 and 15
d. 1937. Ibid. 109, 756.
2. 1931. J. Nutrition 4, 267
1932. Ind. Eng. Chem 24, 650.
1933. J Amer. Diet Assn 9, 295.
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